THE ENGINEERING AND MINING JOURNAL AND COAL

Entered at the Post-Office of New York, N. Y., as Second-Class Matter.

VOL. XLIII. APRIL 2. No. 14.

RICHARD P. ROTHWELL, C.E., M.E., ROSSITER W. RAYMOND, Ph.D., M.E. } Editors.

Cable address: "Rothwell," New York.

Books for review, and all communications for the JOURNAL, should be addressed, Managing Editor, P.O. Box 1833, New York.

Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND, P.O. Box 1465, New York. Articles written by Mr. RAYMOND will be signed thus *; and only for articles so signed is he responsible.

The following gentlemen are authorized to receive advertisements and subscriptions for the ENGINEERING AND MINING JOURNAL:

Mr. C. A. Green, for New York.

Mr. A. R. Brown, Jr., 23 Doane street, Boston, for the Eastern States.

Mr. J. Viennot, 504 Walnut street, Philadelphia, for Pennsylvania, Maryland, and Delaware.

Mr. O. D. Cotton, Columbus, O., for Ohio, Illinois, Iowa, Michigan, and Indiana.

Mr. O. J. Frost, care Boston & Colorado Smelting Company, Argo, Colo., for Denver and vicinity.

London Office: Finsbury Chambers, 76 Finsbury Pavement, London, E.C. Mr. Thomas B. Provis, Civil and Mining Engineer, Manager.

SUBSCRIPTION PRICE, including postage for the United States and Canada, $4 per annum; $2.25 for six months; all other countries in the Postal Union, $5 = 20s. = 25 francs = 20 marks. All payments must be made in advance.

REMITTANCES should always be made by Bank Drafts, Post-Office Orders, or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING COMPANY.

Advertising Rates.—See page XV.

THE SCIENTIFIC PUBLISHING CO., Publishers.

R. P. ROTHWELL, Pres. HENRY M. GEER, Sec. and General Manager.

P.O. Box 1833. 27 Park Place, New York.

CONTENTS.

	PAGE.
Howe's Metallurgy of Steel	235
The Alien Law as Affecting Mining Investments	235
Let Our Exports be in Highly Manufactured Condition	235
Amador and Middle Bar Gold Mines	236
The "Alien Law" as Affecting Mining Investments	236
El Cristo Gold and Siver Mining Company	237
The New Bauer Coke-Ovens	237
Proposals for Steel Guns and Armor-Plates	238
The New Centrifugal Amalgamator	238
Rolling Heavy Steel Rails	238
Elimination of Phosphorous from Iron and its Use	238
Victor Turbines on a Horizontal Shaft	239
The Carbon in Cast Steel	239
Dividends of Mining Companies	240
Brush Electric Lights for Japan	240
Transparent Molten Iron	240
Lithonia	240
Birth of French Railways	240
Lighting the Bartholdi Statue	240
Russian Quicksilver	240
How Gold is Exported	240
Puts, Calls, Spreads, and Straddles	240
Patents Relating to Mining and Metallurgy	240
Metallurgy of Steel	241
Personals	244
Furnace, Mill, and Factory	244
Contracting Notes	244
Labor and Wages	244

MINING NEWS:		MINING NEWS:	
Alaska	245	Tennessee	246
Arizona	245	Utah	246
Brit. Columbia	245	Virginia	246
California	245	Texas	246
Colorado	245		
Dakota	245	MARKETS:	
Idaho	245	Coal	245
Illinois	245	New York	246
Kansas	245	Boston	247
Mexico	245	Buffalo	248
Missouri	245	Pittsburg	248
Montana	245		
Nevada	245	FREIGHTS	248
Ohio	245		
Oregon	246		
Pennsylvania	246		

MARKETS:		FINANCIAL:	
Metals	248	Pittsburg	xiii
New York	248	Baltimore	xiii
Iron	249	S. Louis	xiii
New York	249	South. C. & I. stocks	xiii
Louisville	249		
Philadelphia	249	MEETINGS	252
Pittsburg	249		
FINANCIAL:		DIVIDENDS	xiii
Stocks	249		
New York, 249, 251		ASSESSMENTS	xiii
Boston, 251,	xiii		
San Fr'cisco	251	CONTRACTS OPEN	xix
Gogebic	xiii	**Advertisers' Index**	xiv

WE repeat our notice, that Mr. HOWE'S treatise on the Metallurgy of Steel, which is now in course of publication in the ENGINEERING AND MINING JOURNAL, and which is by far the most complete and valuable work ever written in any language on the manufacture, properties, treatment, and applications of this metal, will extend through a year, at the average rate of five pages a week. Those who desire to secure this work complete should at once notify the publishers, otherwise it will be impossible to furnish full sets of the JOURNAL containing it.

ON another page will be found an interesting communication on the new Alien law as affecting mining interests. This very important enactment has not yet attracted the attention it deserves, and though the ingenuity of the lawyers can probably be counted on to find means of evading what appear to be the plain provisions of any law, yet it is much better that the law should not be brought into contempt by this course; and where, if enforced, it would be so manifestly injurious to a great industry, it is hoped it will be amended, by excepting its application to mines and mineral lands.

No one in this country, however ardent a protectionist he may be, wishes to protect us against the importation of coined gold in exchange for the possible raw material in the rocks, especially when we generally get the best of the bargain. And we know of no case of the purchase of such threateningly large mining estates as call for restrictive legislation in this regard. Considering the results of a good many English investments in American mines, we are almost inclined to think that this Alien law has been instigated by the malevolent use of "British gold," and we call upon our patriotic representatives to remove the stigma which this supposition, if true, would involve.

LET OUR EXPORTS BE IN HIGHLY MANUFACTURED CONDITION.

As in domestic affairs, we learn prudence only under the stress of adversity, so the manufacturer fails to study economies till driven to practice them under the pressure of low prices.

Our copy-book maxim that "Necessity is the mother of invention," though not truer now than when pronounced by a dramatist of the 17th century, can be confirmed by a much larger array of instances. Yet ingenuity is by no means the only agent by which the producer of any commodity meets such an appalling decline in value as we have witnessed and suffered from within the past few years.

Manufacturing is rendered possible only through the beneficent operations of the laws of adjustment, by which the complicated parts of the intricate machinery of trade accommodate themselves to any undue strain.

We have not to look back many years to reach a time when pig-iron, steel, and copper were worth double or more than double the price they command to-day. Had a prophet, whose prophecies were believed, then foretold this fact, utter ruin would have seemed to be the inevitable fate of all our iron and copper firms. The collapse in value has come, but not the collapse in credit. Incredible as it would have seemed in anticipation, iron, steel, copper, and many another product of the furnace and the loom are to-day made out of the same ore or raw material, under the same roof, and by aid of the same fuel, by the hands of the same laborers, and with the money of the same capitalist, and yet the laborer is not starving, and the manufacturer is not ruined.

The result is brought about gradually by the operation of natural laws, without any startling shocks, for our great business cataclysms do not occur during periods of depression, but at the turn of the neap tides of inflated prosperity.

As prices fall, every interest that contributes towards any trade or manufacture acts in sympathy to maintain its existence. Labor, reluctantly perhaps, but of necessity, receives less in accepting its share of the gross returns; the raw material of manufacture, through the same chain of agencies, can be supplied at a lower cost, without actual loss to the supplyer; the transporting companies are obliged to reduce their charges proportionately, in order to retain their traffic; and, lastly, capital, that balance wheel of the whole machine, takes what it can get, and betimes, temporarily, nothing.

Thus in sheer self-preservation, all the allied forces, which make up the great army of industry, move simultaneously under one governing impulse. And this is true, beyond the field of operations of any single trade; for the shrinkage in value in any trade would lead to ruin, unless supported by low prices all along the line. At present, the laborer could not live on reduced wages, had not food and clothing kept pace with the retrogression in his remuneration. The railroad companies could not carry freight at existing rates, were it not for cheaper labor and cheaper construction material, and capital would rebel, and all living on reduced salaries, or shrinking incomes, would be brought to the verge of want, were it not that the cost of living had declined.

One naturally asks, where is the process to stop? or is it to go on operating till life becomes on all hands a hard struggle for bare existence; for, of course, though nature, by maintaining its equilibrium of equivalence, makes the life of trade and all engaged in it possible, she does not make it pleasant, and occasionally by cutting a link in the chain, as when an inclement season produces a rise in the necessaries of life, she warns us that she has not made her beneficent laws simply to satisfy men's greed and selfishness. For wonderful as this power of adjustment is, it can be strained to the snapping point; and when relied on as a principle of action, and not as a mere safeguard, it may, like all the laws of nature thus perverted from their proper use, work irreparable ruin. Because, therefore, we see the decline in value go on from year to year, accompanied by reduced wages, and dwindling returns to capital, it does not follow that we should accept this downward progress as inevitable, far less beneficial.

It is better to be prosperous than poor. Prosperity may breed extravagance, but poverty bereaves our lives of all brightness, and poverty is staring many in the face. While the aggregate wealth of the community is increasing, it would seem as though we were nearing a point when that standard of living which is recognized as characteristic of this country must fall below the zero point, and where any disturbance in the concurrent decline in the price of all necessary commodities would result in actual suffering, because of the ever-narrowing margin between men's earnings and their necessities.

When that margin quite disappears, turbulence follows mere discon

tent in the great masses of the people, and the stability of the social fabric is endangered.

Refore our wage rate falls to this dangerous line, there may be a distinct reaction towards higher prices; but the question, neverthless, forces itself with persistency on every thoughtful employer—how can wages be maintained at a figure which will insure not only safety to trade but remuneration to the workman sufficient to make his life worth living?

One, though perhaps a minor means, towards attaining this desirable end is, we conceive, the production in this country of the highest grades of manufactured articles. The skilled workman of every class naturally commands the highest wages, and the manufacturer of finest goods the highest profits, not only because most capital is employed, but because the keenest ingenuity and administrative skill is demanded. The more, therefore, our natural products are converted, before export, into articles for ultimate consumption, the better for master and for man. Our cereals not only into flour, but into the more delicate farinaceous extracts; our pig-iron not only into steel rails, but into stoves, and grates, and artistic objects for domestic use; our copper into sheets, tubing, cartridges, and into brass in its multitudinous applications. We can not to-day use all we produce, and will in the future have probably a still larger surplus to dispose of. We undoubtedly possess the instincts of an energetic and original manufacturing people, and some advantages which are peculiar. Our workmen are less trammeled by rules, and their wits are incessantly occupied in contriving new devices, and our manufacturers, in supplying the home demand, have been obliged in many branches to shape out for themselves original designs and use original methods, and, therefore, are better able than their more trammeled competitors abroad to recognize and meet the requirements of new markets.

By developing in this direction our energies and capital, we shall undoubtedly help to maintain among the laboring classes the high standard of wage and intelligence which has hitherto characterized this country, and which can only be sustained by laying it down as a principle and acting up to it: that what surplus we draw for export from the infinite wealth with which Providence has endowed us, shall be turned by our wits and our money into the best, most useful and most beautiful articles industry and art can design.

CORRESPONDENCE.

[We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.]

The Amador and Middle Bar Gold Mines.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I send you the following extracts from an editorial in the *Amador Ledger*, published in Jackson, Cal., which corroborates the statements made in my letter, published in your issue of March 19th:

"We take the foregoing from an article in the *Financial and Mining Record* of New York, and give it as a sample of the kind of stuff which that journal is weekly dishing up to its readers concerning the two mining claims referred to. We do not know whether the *Record* has entered upon this puffery business wilfully or through ignorance. Assuming the latter to be the case, we think it is about time to enlighten the metropolitan journal as to the true state of affairs, so that a halt may be called in the publication of this sort of trash.

"They are not mines at present, whatever they may develop into hereafter. They are mere prospect holes, and in a very crude stage of development at that. There are hundreds of such holes in the ground scattered over this county, which have just as much claim to be boomed into big paying properties as the Amador and Middle Bar claims.

"As to the status of the Amador gold mine (a rather high-sounding name, by the way), we may say that it was bonded some six months ago by A. P. Minear, who proceeded to incorporate, and also started to work on a small scale, leaving his son, John I. Minear, in charge as superintendent. It was formerly known as the Ætna mine. At the time the present owners took hold, there was an old shaft 90 feet deep, sunk many years ago, and abandoned. This was the deepest hole on the property. It was full of water then, and in about the same condition now. There was another shaft, and on this hoisting-works of a light character were erected and sinking commenced. This is shaft No. 1. After over six months of labor, this shaft has reached a depth of between 120 and 130 feet on the incline. It is supposed to be following the course of the ledge, occasionally breaking into quartz, but as to the value or volume of the ore-body nothing is practically known.

"No drift has been run to determine its dimensions, and indeed drifting at such an insignificant depth would determine nothing. This is all the work that has been done in the way of actual development. There are some old surface cuts and tunnels which cut no particular figure in determining the value of the property, but which cut an important figure in the glowing reports of the development work done on the claim. The talk of a 40 or a 60 stamp mill at the present stage is ridiculous. A five-stamp mill would be more like judicious mining, to ascertain by actual mill process whether they have any rock at all that will reach the paying standard. Judging from the rate of progress that has been made for the past six months, it will take nearly a decade to tell whether there is a mine there or not. From all indications, we are inclined to the opinion that the mine which the managers of the Amador gold mine are most industriously working consists of the gullible people of New York, who are to be enticed by cunningly worded reports, rehashed in the *Mining Record*, into investing their savings in this big mine on paper.

"As for the Middle Bar gold mine, that is under the same control as the Amador, and the effort to boom it is undoubtedly traceable to the same influences, and prompted by the same motives. It is in a far cruder stage of development than the Amador claim. When the present company acquired it, there was a shaft about 40 feet deep; it is the same depth now. If they have ever seen the bottom of it we certainly have not heard of it. This is the sort of a claim that is said to have $10 to $12 rock, and enough of it to keep a 40 stamp mill going. It would look far more creditable to hurry up a little faster on the ground, and go a trifle slower with the New York boom. Unless they do much better than they have been doing, the day of judgment is likely to overtake them before they have discovered whether they have got a mine or a worthless hole in the ground.

"The *Ledger* would not say one word to depreciate the properties named They are located in a mining region, and on the line of the mother lode, and at any point on this famous belt a big paying mine is liable to be found, whether surface indications are present or absent. We would be as pleased to see the Amador and Middle Bar claims rise into dividend paying mines as any locations in the county. But in behalf of the mining interests of this section, we ask a square deal."

I have now no hesitancy in pronouncing the Middle Bar mine a fraud, so far as the statements of Robinson, the superintendent, are concerned. I repeat that it is nothing more than a prospect hole, and was offered by the owner to Eastern parties, late last summer, for $10,000, but declined by them, as there was nothing in the property or the title to warrant any such price. Robinson was employed by Minear to write letters and reports on this and the Amador mine, when every body in the locality was perfectly aware of the worthlessness of the mines, and of the *soi-disant* expert's opinion. It is a great pity that such schemes are allowed full swing on the New York Stock Board, for burst they must sooner or later, when it comes to building forty or sixty stamp mills, as recommended by the modest superintendent. Just such misrepresentations as these have damaged legitimate mining greatly in this and adjoining districts. Perhaps some of your readers may remember the collapse of the "Boston" mine in Buckeye Gulch, near Mokelumne Hill, under the management of this same Robinson, and this is only one of many such cases where an expensive mill was built before ascertaining the value of the mine and extent of the quartz.

TRUTH.

THE "ALIEN LAW" AS AFFECTING MINING INVESTMENTS.

By Wm. Hyndman, Attorney-at-Law.

[PUBLIC—No. 126.]

An act to restrict the ownership of real estate in the territories to American citizens, and so forth.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful for any person or persons not citizens of the United States, or who have not lawfully declared their intention to become such citizens, or for any corporation not created by or under the laws of the United States or of some State or territory of the United States, to hereafter acquire, hold, or own real estate so hereafter acquired, or any interest therein, in any of the territories of the United States or in the District of Columbia, except such as may be acquired by inheritance or in good faith in the ordinary course of justice in the collection of debts heretofore created: *Provided*, That the prohibition of this section shall not apply to cases in which the right to hold or dispose of lands in the United States is secured by existing treaties to the citizens or subjects of foreign countries, which rights, so far as they may exist by force of any such treaty, shall continue to exist so long as such treaties are in force, and no longer.

SEC. 2. That no corporation or association more than twenty per centum of the stock of which is, or may be, owned by any person or persons, corporation or corporations, association or associations, not citizens of the United States, shall hereafter acquire or hold or own any real estate hereafter acquired in any of the territories of the United States or of the District of Columbia.

SEC. 3. That no corporation other than those organized for the construction or operation of railways, canals, or turnpikes shall acquire, hold, or own more than five thousand acres of land in any of the territories of the United States; and no railroad, canal, or turnpike corporation shall hereafter acquire, hold, or own lands in any territory, other than as may be necessary for the proper operation of its railroad, canal, or turnpike, except such lands as may have been granted to it by act of Congress. But the prohibition of this section shall not affect the title to any lands now lawfully held by any such corporation.

SEC. 4. That all property acquired, held, or owned in violation of the provisions of this act shall be forfeited to the United States, and it shall be the duty of the Attorney-General to enforce every such forfeiture by bill in equity or other proper process. And in any suit or proceeding that may be commenced to enforce the provisions of this act, it shall be the duty of the court to determine the very right of the matter without regard to matters of form, joinder of parties, multifariousness, or other matters not affecting the substantial rights either of the United States or of the parties concerned in any such proceeding arising out of the matters in this act mentioned.

Approved, March 3d, 1887.

The foregoing "Act of Congress," which became a law of the land by the approval of the President the day before the last of the late session, is entitled to more than passing consideration, in view of its probable effects on mining in the territories.

The present time is one of activity and interest in mining promotion and investment across the sea, especially in London, where a number of transactions, involving valuable American mining properties and large sums of English capital, are just maturing.

The writer, with a knowledge of the facts, makes it as a moderate estimate, that sales to the amount of $10,000,000 on mining property, in Idaho Territory alone, have been negociated in England and Scotland within the past year, not yet entirely consummated.

The possible serious consequences of this law will hence readily occur. And it will seem to be a strike at our most vital mining interests, which depend upon capital for development, which capital is and should be welcome from any source, as all familiar with mining enterprises will readily concede.

Mining for the precious metals, while a strictly legitimate business when properly conducted, is, however, one of ventures and more than average business risks. And experience has proven that the process of development of mineral resources, and expenditures incurred in such pursuit, has told more to the benefit of mining regions and communities than to the capitalists and investors, even where the latter realize on

investments and succeed. Uninhabited and barren localities are peopled cities and towns built up, and great good and prosperity inures to great numbers. No matter from what source the capital has been derived, it has gone in our land to the development of loyal American communities, and the immediate benefit of our citizens in the first instance.

There can be no reasonable objection urged to foreign investment in our mines. On the contrary, it is what we most desire, and in so far as this law is a bar thereto, it is a detriment to material interests and a mistake.

The writer being recently in Washington took occasion to interview and consult various heads of departments in the national government, senators, and members of Congress, as to the scope and effect of this act. Mr. Payson, member of Congress from Illinois, the author of the bill, frankly admitted he had no special knowledge on mining matters, and that the object of the bill was to prevent large holdings of agricultural and grazing lands by non-resident and alien parties and corporations, a move that in general is to be commended; the establishment of such holdings in the nature of small dukedoms and prinicipalities on our domains, owned and controlled by aliens, being unquestionably foreign to the spirit of our American institutions. All, however, in the main, concur that the effect of the bill is injurious to mining interests in territories, and is to be regretted, and opine that had the the objection been urged, an exception as to mining property would doubtless have been made.

The question will occur as to the validity of such legislation. Can government, after selling and granting realty by letters patent to a party and assigns, say to a subsequent grantee, "We did not intend that *you* should acquire, hold, or own this property. So we will take it back, give you nothing, and sell it again to some one else"? Statesmen and lawyers agree that Congress can legislate to such effect. Not, however, to a retroactive extent, nor as affecting existing and pending contracts. It is, moreover, a mooted question as to whether leases for a long term might not avail to defeat the object of the bill, and liabilities might be admitted by a lawful holder to an alien party, whereby such alien could, in the language of the act, "in the ordinary course of justice" acquire a judgment title. But while the act is hardly perfect as to the carrying out of its intent, it may yet prove an unintentional blow at mining interests as indicated, and a possible serious damage, which for the reasons suggested should be remedied as soon as practicable by an amendment to the above law, excepting mining property and interests from its operations.

OFFICIAL STATEMENTS AND REPORTS.

EL CRISTO GOLD AND SILVER MINING COMPANY.

We give below some extracts from the very favorable report of Mr. J. G. Carleton, who recently examined this property for Mr. Robert B. Brown, of this city:

"El Cristo is a well-defined fissure vein, lying in slate dipping 78 to 80 degrees west, with a course or strike north 20 degrees east, varying toward the southern boundary north 30 degrees east. The outcrop is pronounced, and can be followed for over 2000 feet. It is especially prominent in the bed of two ravines which cut through the vein at right angles to its course, but between these points, a distance of 1000 feet (about), it is broken into a series of irregular spurs of varying inclination which have a general tendency toward the same point below the present development. The presence of these spurs gives rise to the current notion of the existence of a number of distinct parallel veins.

"The mining done by the Spaniards has been on a large scale, and undoubtedly produced many millions of dollars, as is currently reported and believed in that country. This work was entirely limited to ground above the water level, and to the parallel veins or feeders of the main lode and above their point of convergence, which is now appearing in the great ore-body being developed by the present work, and which is below what they considered the water level. While it is evident that some of these parallel veins have already entered and enriched the main lode, it will require a further depth of several hundred feet for all to enter, judging from their inclination at points above.

The present development consists mainly of a double compartment vertical shaft, sunk near the mouth of what I designate as adit 'B' in the 'North Ravine.' This shaft has cut through the vein at 115 feet and reached a depth of 150 feet. It is timbered throughout with eight by eight timber and lagged with two-inch plank. At a depth of 50 feet, a drift running south 60 feet connects with a winze sunk from adit 'B' where developed, the vein shows an average width of 15 feet; more accurate measurements can not be obtained, owing to the broken character of the hanging-wall. This irregularity is easily accounted for, by the entrance of the parallel veins or spurs, to which I have already alluded, and which will doubtless affect the width of the lode, as one after another converges with it in depth. From appearances at the surface, I judge that all the parallel veins will enter the main lode within 400 feet from the bottom of present shaft. The vein, after having passed out of the shaft at the depth of 115 feet, bulges to such an extent that the foot-wall is thrown back into it, and it is my opinion that a cross-cutting of the lode at the depth now reached would show the width of the ore-body to be now from 20 to 30 feet.

"Without hesitation, I can say that the quartz in El Cristo vein is of the very best quality, known for strength and permanence, and is apparently of the same general character as that of the ore-bodies of the main fissure of the Comstock lode in Nevada, and both quartz and metal in El Cristo strongly resemble the richer ores in that mine.

"The prevailing silver-bearing ores now in sight are sulphides of iron, lead, and silver, zinc blend and native silver, with small particles of ruby silver. The central and foot-wall portions of the vein carry most of the gray and black silver, and also the native and ruby silver, the latter showing themselves strongly from a depth of 100 feet downwards. The ores can easily be worked by milling process, roasting and amalgamation, at a cost not exceeding $12 per ton for mining and milling.

VALUE OF ORES AND ESTIMATES OF ORE IN SIGHT.

"All figures given below are determined by assays of samples taken by myself. All said samples were averages containing no selected ore. And I was careful to exclude all the high-class ore taken from the foot-wall, which contains wire silver to an extent that interfered with proper sampling. From a large number of such average samples, I obtained results running from 175 ounces to 290 ounces, per ton, silver. Average samples taken from the richer portions which were excluded from the above, yielded from 327 ounces to 620 ounces silver per ton, those from the central portion of the vein carrying also from $4 to $10 gold. I notice that samples taken at greatest depth yielded the highest results. It is not an unfair conclusion that the ores of El Cristo exposed by the new developments will average throughout $300 per ton, gold and silver.

"In estimating the number of tons of ore in sight, present developments limit us to the measurement of a body of ore, say 15 feet wide, bounded by the shaft and adit 'B,' and cut through for 60 feet by a drift (12,000 tons, about). Assuming also (and it is a fair assumption), that the ore exposed at point 'C,' 70 feet north of the shaft, in an old drift, is a continuation of the same ore-body now in sight in the shaft, we can add another block of 12,000 tons to the amount already mentioned, giving, say a total of 24,000 tons; and if we allow an average value of only $200 a ton, we may calculate that there is now technically in sight in El Cristo, nearly five millions.

"I note further that the extension of adit 'B,' although partially caved, shows the same character of ore on the foot, as far as it is possible to enter—some ten feet beyond the winze I have mentioned.

"In the 'South Ravine,' and upwards of 1000 feet from the entrance of adit 'B' and the main shaft, there is situated adit 'A,' which drifts toward adit 'B,' and has been cleaned out for a distance of 403 feet. It was used by the Spaniards for stopping ores from cross-veins above the water level. Winzes lately sunk (now full of water) are represented to have entered the vein. The ores on the dumps of these winzes are identical in character with the ore of the main El Cristo vein. I believe that a shaft sunk near this point will prove the continuity of the main El Cristo vein for the whole distance between the two ravines, upwards of 1000 feet. This conclusion is reached by considering the course of the vein as it leaves the North ravine. The same favorable formation here presents the same tendency of convergence to this point of the many spurs or parallel veins, the same extensive Spanish workings in the ground above, and finally, the reported great richness of the ore there extracted.

"A drift north, 150 feet in depth, to meet a corresponding drift south from the present working shaft, would, in my opinion, develop within eighteen months, ore to the extent of ten times the quantity now exposed to measurement. It is needless to say that all indications point to the existence of large ore-bodies extending to great depth, as well as north and south along the lode.

"It is the best mine, considering its development, that I have ever seen or examined, and I firmly believe that, with competent management, El Cristo will become one of our best dividend producing mines.

"Since submitting my report of March 7th, reliable information has reached me confirming my most sanguine hope of the continuity of the ore-body that has been followed for the whole depth of the shaft, and that the quality of the ore remains unchanged. I also learn, with some surprise, that the foo-wall still falls within the shaft, indicating that there is still a tendency towards an increased width in the vein."

THE NEW BAUER COKE-OVEN.

Written for the Engineering and Mining Journal by P. Koerner, M.E.

I have just received some very remarkable results effected by a comparatively new coke-oven at the Steel Works of Creuzot, France, which may interest the progressive readers of the JOURNAL. It is, perhaps, proper to state that these results come from the *management* at Creuzot, and are therefore unbiassed and authoritative.

1. The material coked consists of 55 per cent Creuzot anthracite and 45 per cent of St. Etienne gas coal.

2. The output of one hundred oven charges, at the beginning, was 80¼ per cent of the possible 82 per cent; at present, the output is equal to calculated results.

3. The average time of coking for these one hundred charges was 20·78 hours.

The consumption of coke per ton of iron with this coke is somewhat below the average of American practice, being 1143 kilos.

The oven in question is the invention of a German coke expert, Dr. Theodore von Bauer, and the works at Creuzot are now engaged in replacing their 192 Smet and 234 Appott ovens by his.

The results, by modifications of this oven to adapt it to changed conditions in Prussia, Belgium, Bohemia, Austrian Silicia, and Hungary, coking at these different places the very fullest coals, as well as those which could hitherto not be coked at all in any oven is use, have been equally phenomenal.

The construction of these ovens is surprisingly simple; the size of a battery of 24 ovens, with a capacity of 65 to 70 tons daily, is about 39 feet diameter; the gases which escape from the coking coal can be taken away, deprived of tar and ammonia, and reconducted into the heating chambers in the center of the battery; or they may be allowed to go direct into these heating chambers; in either case, they are thoroughly mixed with preheated air, and the combustion below and around the individual ovens is rapid, and the heat very intense. I have referred to the intensity of the heat in this oven in a former article, and have to add now that only very good fire-bricks ought to be used in their construction.

The management is very simple: No ram is required; the discharge is effected at the side of the battery; when the oven doors are opened, the coke rushes out and is cooled, and this is done so rapidly that the coke retains its beautiful steely appearance, and need only under the most reckless carelessness contain more than ½ to ¾ per cent of water.

Four laborers attend a battery of 24 ovens for discharging and cooling the coke.

The coke from very different coals, the oven being carefully adapted to each kind, is always porous and very strong; the braize, or small coke, exceeds nowhere, except at Creuzot, where so large a proportion of anthracite is used, 1 per cent.

For coals high in sulphur, Dr. von Bauer attaches a desulphurising

apparatus, which has in four cases lessened the quantity of sulphur remaining after coking, by 75 per cent. The process is applied just before drawing the coke and acts very energetically.

There is no loss of heat while charging or discharging the oven; in the one case the door, and in the other, the charging hole, remains closed.

No other oven construction presents such facilities for the extraction of the by-products, either by the Jameson or Carvès process; and with none is the use of the heat of the escaping gases for steam or similar purposes, so simple. Indeed, when one looks at the simplicity of the whole thing by the light of the results ascertained, one ceases to wonder why continental steel works can send their Bessemer rails to us, as has happened within two months, paying duty and freight for 4000 miles. The fuel is the main factor in the case.

The first cost of these ovens is, of course, an important consideration; in a general way, it can be said that in all localities where the better class of firebricks are of reasonable cost, the cost of these ovens can be brought *within* that of bee-hives of equal capacity, and if well built, the expense of repair is merely nominal; no destruction by the use of cold water inside the oven; no luting of doors; no repair gang of masons!

Taking simplicity and cost of construction, ease and cheapness of management, uniform good results, output equal to the fixed carbon of the coal, plus ashes, into account, and all these things *fortified by actual experience*, it can be fearlessly asserted that no improvement in the production of this valuable fuel approaches this one, except, perhaps, the Krupp oven heretofore spoken of.

It may be added, that this oven is not "a variety of the Belgian oven," and that I am prepared to erect them as the representative of Dr. von Bauer in this country.

WILKES-BARRE, PA., March 25.

PROPOSALS FOR STEEL GUN-FORGINGS AND ARMOR-PLATES.

We have received from the Secretary of the Navy the following list of prices quoted for steel gun-forgings and armor-plates:

PROPOSALS FOR STEEL GUN-FORGINGS.

Kind of forging.	Calculated tons.	Bethlehem Iron Co. Price p. ton.	Cambria Iron Co. Price p. ton.	Midvale Steel Co. Price p. ton.
Tubes and jackets for 6-inch B. L. R....	146·418	$672.00	$800.00	$88580
Tubes and jackets for 8-inch B. L. R....	31·804	716.80	700.00	1,008
Tubes and jackets for 10-inch B. L. R..	426·888	761.60	650 00	1,232
Tubes and jackets for 12-inch B. L. R...	59·470	806.40	750.00	1,232
Hoops for 6-inch and 8-inch B. L. R.....	140·474	672.00	800.00	885
Hoops for 10-inch B. L. R.....	330 024	761.60	650.00	1,232
Hoops for 12-inch B L. R....	49·796	761.60	750 00	1.232
Trunnion-bands..	15·?92	672.00	800.00	1,680
Plugs and mushrooms for all calibers...	20·864	672.00	650.00	885
Total price.....		$902,230.79	$851,513.90	$1,397,240

PROPOSALS FOR STEEL ARMOR-PLATES.

Kind of material.	Estimated tons.	Bethlehem Iron Co. Price p. ton.	Cleveland Rolling Mill Co. Price p. ton.
Side armor for Puritan	734·7	$510.00	$600
Side armor for Amphitrite and class.....	1,066·8	510 00	600
Turrets and pilot houses for 4 monitors....	835 8	575 00	600
Smoke-pipes and ventilators for 4 monitors.....	266·3	575.00	600
Armor for breastworks for 2 armored vessels....	680·0	575 00	600
Armor for turrets, conning towers and ammunition tubes for 2 armored vessels.....	485·0	575 00	600
Part of side armor for 2 armored vessels.....	364 0	500.00	600
" " "	468·0	5 5.00	600
" " "	272 0	600.00	600
" " "	196 0	600.00	600
Rolled plates, protective deck armor and gun-shields...	1,135·0	490.00	600
Turret and side armor bolts and steel accessories.....	181·0	650.00	600
Small armor bolts, steel...	6·0	650.00	600
Tubing and washers, wrought-iron.....	12·0	180.00	600
Total price.....		$3,610,707.50	$4,021,560

THE NEW CENTRIFUGAL AMALGAMATOR.

In giving a description of this neat little apparatus in our issue of the 19th of March, we announced our intention of witnessing some experiments that were to be made for the purpose of demonstrating its working capacity and economical application.

The trial took place at the works of Messrs. Brewster & Co., in East Twenty-fifth street, on Tuesday last, and was watched with much interest by several professional and other gentlemen.

About 200 pounds of sifted sand was taken from several barrels and well mixed, and to this was added about sixteen dwts. of very fine gold, careful panning having previously shown the sand to be free from any trace of the precious metal.

The mercury, after being duly tested, was placed in the revolving pan—the disk was lowered and fixed in position—the machine set in motion, and the auriferous sand, moistened by a small stream of water, fed through the hopper. During the ten minutes consumed in amalgamating the whole 200 pounds, the water, which flowed over the sides and bore away the pulp, was constantly examined and panned, but not the least trace of escaping mercury was detected.

After the final "clean up," the amalgam was separated, dried, and fluxed in the usual way—the resulting bullion being digested in nitric acid to free it from all adhering particles of silicates or other foreign matters. The precise weight was then taken, and found to be very nearly identical with that of the gold dust originally used.

In the face of these facts, we feel justified in expressing great satisfaction, and have no hesitation in advising all those who are interested in the elimination of fine free gold from any kind of pulverized ores—to give it a trial.

Rolling of Heavy Steel Rails.—The steel-works of the Cockerill Company at Seraing, Belgium, commenced last week the rolling of the heavy rails, of the Sandberg section, weighing 52 kilogrammes per meter. The ingots weigh a ton each, and furnish two lengths of rail. The start is reported to have been completely successful.

FROM FURNACE TO FIELD.

The Elimination of Phosphorus from Iron and its Use, by Francis Wyatt, Ph.D.

(*Concluded from page 152.*)

If the general adoption of mineral fuel and the invention of puddling were looked upon as emblems of last century's progress, the simultaneous discoveries of Bessemer and Siemens, and the rapidity with which each has been modified to meet different requirements, are no less characteristic of our own advancement.

The refining process known as the "Siemens-Martin Open Hearth" is so called because, while the discovery that an exceedingly high temperature is caused by burning hot gases in heated air is due to Siemens; its industrial application to the fusion of iron in a reverberatory furnace is due to Martin. It was originally designed for ores containing only very little phosphorus and silicon, and engineers soon perceived that among other advantages its use would insure.

First. The profitable utilization of all kinds of steel and iron scraps unavailable in the Bessemer process.

Second. The production of a much more uniform and regular metal in all grades of soft and solid steel.

In 1877, Sir J. Lowthian Bell suggested the possibility of eliminating injurious constituents from inferior pig-iron, by causing it to pass, while in a state of fusion, through melted oxide. If in ordinary puddling, argued this distinguished metallurgist, the intimate admixture and eventual oxidation can be produced by mere constant stirring with a rabble, the same result should be even more easily and perfectly attained by causing the charge to run from this furnace into a molten bath of oxide on a revolving hearth, providing the temperature be maintained at a point sufficiently high to keep both metal and slag in a state of fluidity.

Herein then, is the point of departure from the siliceous, or acid chamber lining hitherto employed, and, with the adoption of a basic substance, it would at first sight appear as if the two great steel processes must be characterized by the same chemical transformations in the bath, and that what could be said of the one would equally apply to the other. Experience has, however, proved that, whereas in Bessemer's basic converter very little inconvenience arises from the combustion of the carbon before the phosphorus commences to be oxidized; it is essential in the open hearth that the latter be completely driven off before the carbon commences to burn, since, were it otherwise, the metal would cease to circulate in the bath, and become incapable of offering up a constantly changing surface for oxidation by the slags. By blowing a considerable quantity of quicklime through the tuyeres of a Bessemer converter into a highly phosphorized molten pig-iron, it has been shown that phosphoric acid is immediately formed, and carried to the surface as tricalcic or tetra-calcic phosphate, before any of the carbon commences to go off, and although the method has never been applied, it may be taken as an example of what it is possible to accomplish.

In the working of basic lined open-hearth reverberatory furnaces, if we can not boast of having reached perfection so far as steel is concerned, we can at least effect its complete dephosphorization with rapidity and economy. This has been conclusively shown by Mr. F. W. Harbord in his communication to the Iron and Steel Institute of Great Britain, and without following him through the whole of his experiments, it will be interesting to select and examine his No. 3 as typical of them all.

His charge consisted of about 70 per cent white pig-iron, 30 per cent steel scrap, and 4 per cent of spiegeleisen; the bath when completely melted at the end of five hours showing:

C, 2·300; Si, 0·870; P, 2·500; Mn, 0·960; S, 0·230.

Two samples were taken from the metal every half hour, and their mean analysis adopted as representing its average composition. Summing up the averages obtained at the end of about 8 hours, the composition of the bath then was:

C, 0·450; Si, none; P, 0·048; Mn, none; S, 0·290;

while that of the corresponding slags is set down as

SiO_2,	12·00	MnO,	6·81
P_2O_5,	13·30	CaO,	15·20
Fe_2O_3,	3·08	MgO,	0·85
FeO,	43·11	Al_2O_3,	4·90

Now, while perfectly satisfied with the thoroughness of this dephosphorization, we observe with surprise that, although the original charge contained about 50 pounds in weight of phosphorus, we are unable, on comparing the metal and the slags at the end of the operation, to find more than half this quantity.

Of the total weight of his slags, the author makes no mention, and hence it is impossible to accurately determine the exact quantity of phosphoric acid they contained; but if we assume it, for present purposes, to have been 400 pounds, we shall reach a total of 23 pounds of phosphorus, which, added to about one pound remaining in the steel, still leaves 26 pounds of the valuable element to be accounted for.

The readers of this journal will remember the frequent allusions that have been made in its columns to the inventions and improvements effected in open-hearth furnaces by Mr. James Henderson, of New York; and it will be very *à propos*, at this juncture, to shortly refer to his methods. Premising that the whole secret of successful working lies in the supply of gases in the exact chemical proportion necessary to insure their perfect combustion, Mr. Henderson informs us that in his latest modification, the blast-machines that furnish the air required for generating and consuming these gases may be driven at such variable speeds as to insure either a neutral, an oxidizing, or a reducing flame at the will of the operator.

In a brief account of his own experiments, the inventor has presented us with a series of results, which, while entirely in accord with those of Mr. Harbord as regards the steel, possess the additional advantage of showing how all the phosphorus, which that gentleman evidently lost, may be easily recovered.

He says: "By dint of very careful watching and constant sampling and analysis, I ascertained that I was losing a large proportion of the phosphorus through volatilization, and in 1883 I was able to patent a process for its condensation. In my specification, I claim that it is a compound process of depurating iron by subjecting the fusing metal to the

action of vapor and water in a revolving reverberatory furnace, and condensing the resulting condensible products.

"To the specification, I have joined the drawing of a condensing apparatus attached to the exit flue of the furnace chambers, the gases from which pass under and through the boiler to a feed-water heater, whence they are forced by a gas exhauster through the flue, into a tank beyond containing milk of lime. The gases are cooled in their transit by a spray of water, reduced by the ammonia process to about 35° F."

With a charge of exactly similar composition to that used by Mr. Harbard, there resulted from this method :

Left in the finished metal about	1 pound phosphorous.
400 lbs. slag containing 15 per cent P_2O_5 = 60 lbs =	26 " "
100 lbs. calcium phosphate containing 46 per cent P_2O_5 =	20 " "
Total phosphorus recovered from a charge containing 50 pounds	47 pounds.

It will of course be readily understood that a small quantity would have been absorbed by the basic lining, and could be recovered thence without difficulty.

To manufacturers who produce steel on an extensive scale, sufficient has been said to show that dephosphorization of inferior pig-iron in the basic open hearth is worthy of consideration, not only because it produces steel of remarkable purity, but because the phosphorus obtained is of a commercial value, sufficiently great to render its elimination an object of the first importance. Especially does this apply to the phosphoric acid condensed by Mr. Henderson's method, since it is not only free from any of the disadvantages offered by the slags, but is in the very best of all forms for agricultural purposes.

To the inventor's plan of transforming it into tricalcic phosphate by causing it to run into a milk of lime, we can not, however, adhere, it being in our opinion preferable to concentrate the liquid until it contains from 40 to 45 per cent of P_2O_5, and then to sell it to neighboring farmers at the rate of about 10 cents per pound, for mixture with other fertilizing agents. The present ridiculous practice of forcing those who live far from manufacturing centers to pay heavy freights per ton on materials which seldom contain more than 15 per cent of plant food should be corrected, and as the transport of even a concentrated liquid over long distances is somewhat inconvenient, we may suggest the adoption of a ready means by which our iron masters may bring about a much desired reform.

If it be admitted that in the use of the so-called super-phosphates, the only practical advantage is that conferred by a complete state of disintegration, it naturally follows, that instead of sulphuric, any other sufficiently powerful acid, not liable to produce a deleterious combination, may be equally well employed. By treating raw phosphates in a finely powdered state with the concentrated product from our furnace condensers, we should, therefore, produce an article which, instead of being weakened by dilution to half its original strength, would stand in the relation to the present best commercial "supers" of 3 or 4 to 1.

To illustrate our meaning, we may make a mixture with the well-known phosphates of the Charleston basin, their composition being :

Moisture and water of combination	5·90
Phosphoric acid	26·50
Lime	38·00
Carbonic acid	4·25
Oxide of iron and alumina, fluorine, etc.	14·35
Insoluble siliceous matters	11·00—100·00

Finely ground and absolutely dry, the powder is treated with a sufficiency of the phosphoric acid solution to effect complete saturation and decomposition (about one part of the former to about one and a half of the latter will be found convenient proportions). Thoroughly blended while in a semi-fluid state, a reaction soon sets in, considerable heat is evolved, and the mass swells up and acquires sufficient consistency to be carried to drying ovens. Exposed to a temperature of about 200 degrees Fahr. until every particle of moisture is expelled, it will lose about 35 per cent of its weight, and will be found upon analysis to contain from 40 to 45 per cent of perfectly soluble, assimilable, and immediately available phosphoric acid.

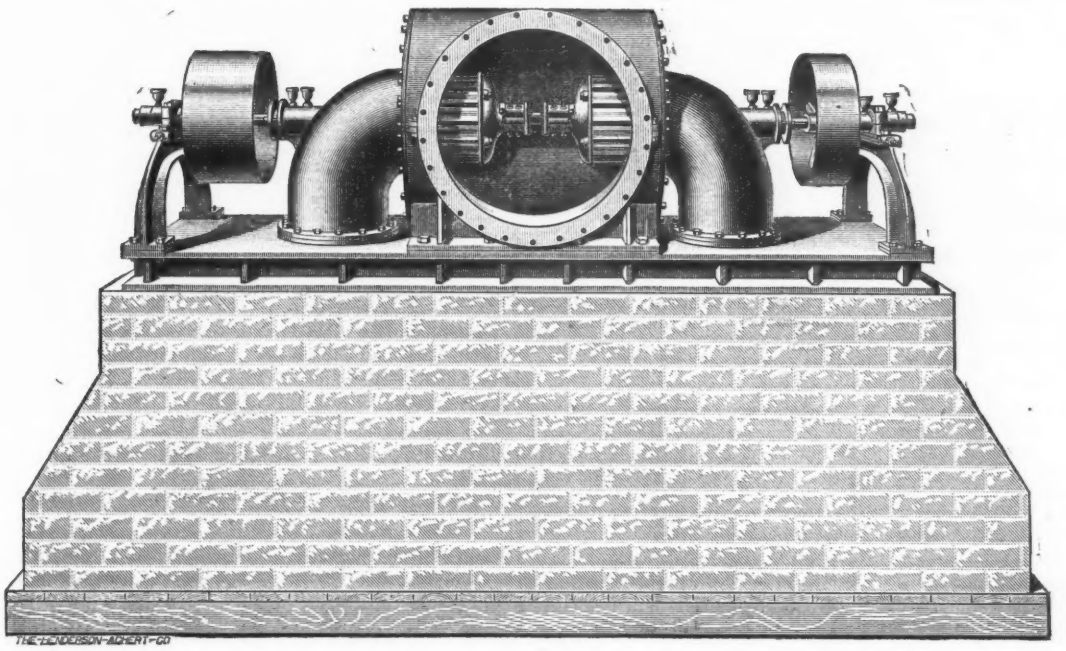
In this cursory review, we have strayed far beyond the limits we had originally laid down, and if we have been somewhat incoherent, and occasionally obscure, we can only point, in extenuation of our shortcomings, to the vastness of our subject. We have been actuated by a great desire to see what is now regarded in many quarters as valueless furnace refuse assume the position of a marketable commodity, which, from its cheapness and intrinsic worth, must confer the greatest possible benefits on mankind.

In all questions involving a departure from the beaten track of prejudice and custom, there is an inherent tendency to "let sleeping dogs lie," whereas the contrary should be the case, for what we require is discussion and enlightenment. One blunder conflicts with another, each destroys its opponent, and truth is evolved. This is the course of the human mind, and it is from this point of view that the authors of new ideas and the proposers of new contrivances must be looked upon as benefactors.

Whether new ideas are right, or whether they are wrong, is the least part of the question. They tend to excite the mind, they open up the faculties, they stimulate us to fresh inquiry, they place old subjects under newer aspects, they disturb the public sloth, and they rudely interrupt that affection for tradition and routine, which, by inducing men to go groveling on in the ways of their ancestors, stands in the path of every improvement, as a constant and too frequently fatal obstacle.

VICTOR TURBINES ON HORIZONTAL SHAFT.

The accompanying engraving shows a pair of 12-inch Victor turbines arranged on a horizontal shaft, with cast-iron flume, draft tubes, end bearings for shaft, and driving pulleys complete, all mounted upon a substantial cast-iron bed-plate, manufactured by the Stilwell & Bierce Manufacturing Company, Dayton, O. This pair of wheels was furnished to the Aspen Electric Company, Aspen, Colo., for driving their electric light plant. The company are highly pleased with these wheels, and where the situation admits of their use, they are preferable to wheels arranged in the ordinary way. The Stilwell & Bierce Manufacturing Company lately started a pair of 30-inch wheels on horizontal shaft to run under 34 feet head for the Cowles Electric Smelting and Aluminum Company, Lockport, N. Y., for driving their dynamo, and have received letters from this company and also from their engineer commending their plant in the most favorable terms. They are also at work on several other large plants of this kind, which will soon be ready to ship.



VICTOR TURBINES ON HORIZONTAL SHAFT.

The Carbon in Cast Steel.—Messrs. Ormond & Werth, of the Creusot Iron-Works, France, have recently obtained interesting results from their researches into the inner structure of cast steel. A very thin rolled plate was placed on a pane of glass and carefully treated with nitric acid until the iron was all dissolved, in such a way as to leave the carbon in its normal condition. When this skeleton was examined with the microscope, it was discovered that the carbon is not at all distributed evenly throughout the mass, but that the steel consists in its inner structure of tiny particles of soft iron inclosed in cells formed by the carbon. These cells are again distributed in the iron, either combined or as a collection of cells, having considerable open spaces between them, so that such a plate or sheet of steel may be rolled until it becomes transparent. These spaces are irregular in shape, and may in the raw material be almost noticeable, but they are reduced in proportion to the treament to which the steel is subjected either by rolling or hammering, as naturally the homogeneity is increased.

DINIDENDS PAID BY MINING COMPANIES DURING MARCH AND FROM JANUARY 1st, 1887.

NAME OF COMPANY.	Location.	Paid in March.	Since January 1.	Total to date.
Adams, s. L.	Colorado		$15,000	$555,000
Atlantic, c.	Michigan		40,000	360,000
Bellevue, Idaho, s. L.	Idaho	$12 500	37,500	225,000
Big Bend Hydraulic, G.	Dakota	6,000	18,000	228,000
Calumet & Hecla, c.	Michican	500,000	500,000	28,850,000
Central, c	Michigan		40,000	1,820 000
Cons. Cal. & Virginia, s.	Nevada	108,000	324,000	388,800
Colorado Central, s. L	Colorado		13,750	185.000
Daly, s. L	Utah		75,000	75,000
Elkhorn, G. s.	Montana	5,000	15 000	165,000
Granite Mountain, s.	Montana	100,000	300 000	1,900.000
Helcla Cons, G. s. L. c.	Montana	15,000	45,000	1,167,000
Iron Silver, s. L.	Colorado	100,000	100,000	1,900,000
Homestake, G.	Dakota	25,000	75,000	3,768 500
Illinois, s.	New Mexico		25,000	25,000
Mary Murphy, G. s.	Colorado	17,500	35,000	52 500
Montana, Limited, G. s	Montana		204,600	999 900
Mount Pleasant, G	California		45,000	150,000
Ontario, s. L.	Utah.	75,000	225,000	8,150,000
Original, s.	Montana		3,000	200,000
Plymouth Cons, G.	California	25,000	75,000	1,900,000
Quicksilver, Q	California		53,750	849,650
Quincy, c.	Michigan		160,000	4,570,000
Silver King, s.	Arizona	25,000	75,000	1,850,000
Small Hopes. s.	Colorado	50,000	150,000	2,662.500
St. Joseph's Lead, L.	Missouri	30,000	30,000	754.000
Viola, Limited, s. L.	Idaho		18,750	55,750
Yankee Girl,	Colorado	25,000	50,000	1,162,500
Total.		$1,119,000	$2,673,350	$64,460.100

Brush Electric Lights for Japan.—Messrs. Fujioka and Yashima, who have been in this country for the purpose of selecting electric lighting apparatus, have purchased a plant of 100 arc lights from the Brush Electric Company. This first installment of plant will be used for the illumination of the Mikado's park and grounds surrounding the imperial palace.

Transparent Molten Iron.—Mr. W. Ramsay has observed that the molten iron seen during a casting of several tons is transparent. It was possible to see bodies through the stream of metal, they taking, however, a yellow tinge. The observation is one of much interest, and perhaps others engaged in the iron industry will be able to confirm it, since it is hardly likely that the phenomenon has not been witnessed before.—*London Engineering.*

Lithonia.—The Ordnance Department of the Washington Navy Yard has been making tests of "Lithonia" as a paving material. Compared with Richmond granite, it stood the crushing test as follows: Richmond granite, four cubes crushed at from 68,275 pounds to 83,900 pounds per square inch; Lithonia, two cubes crushed at 76,800 pounds and 83,400 pounds, and two more were not crushed at 85,000 pounds, the practical limit of the machine.

The Birth of French Railways.– A paper was recently read by M. Léon Aucac, at the Paris Academy of Sciences, on "The Inauguration of Railways in France—its true date." The author points out that the proposed celebration in 1887 of the fiftieth anniversary of this event rests on an historical error. The first line actually completed was that between Saint-Etienne and Andrezieux, 23 kilometres long, opened on October 1st, 1828; that is, nine years before the assumed date, 1837.

Lighting the Barthoidi Statue.—Arrangements have been completed for increasing and improving the illumination of the Bartholdi statue of Liberty on Bedloe's Island, N. Y. A strong lens will be placed in the torch, five additional electric lights will be placed around the base, making 13 of such lights in all, and a number of incandescent lights will be placed in the interior of the statue. The light to be placed in the torch will be one of the most powerful fixed lights in the world. It is intended more for the purpose of enhancing the grandeur of the statue than as an aid to navigation, as a light of much less power than the one selected would answer equally well for the latter purpose. The proposed work will be done under the supervision of Lieut. John Mills, of the Engineer Corps.

Russian Quicksilver.—Quicksilver near Nikitofka station, on the Koursk-Kharkoff-Azoff Railway, is now being worked by a company. A pit 280 feet deep is being sunk provided with the necessary machinery for the production of quicksilver, and buildings and dwellings for the miners are in course of erection, all of which will be shortly completed. The ores are expected to yield 1 per cent of metal. The samples which have been sent to the University of Kharkoff are pure, and in quality not inferior to foreign. The yearly importation of quicksilver has been about 50 tons, at an average price of £240 per ton, but now on account of its anticipated cheaper production it is thought the demand will increase. There are many projects on foot, some of which, if realized, will do much toward developing the trade of the country.

How Gold is Exported.—Each keg contains $50,000 in clear gold. It is from the Bank of America, at New York, that most of the gold is shipped from that city. The foreign steamships sailing from this city now carry little or no gold, although the reverse was the case years ago. The shipments of gold are not generally on the bank's account. At a first glance, persons might well suppose that when the demand arises for gold to send abroad the shipper would only have to send in his order for his hundreds of thousands to the Sub-Treasury, where millions of specie are on deposit. But there are sufficient reasons why this plan will not work. The Sub-Treasury can pay out its coin only to creditors of the government. With the Bank of America the associated banks keep on deposit constantly an enormous sum of gold, sometimes amounting to $40,000,000. To the members of the bank association the Bank of America issues its own certificates against these deposits, redeemable on demand. So, when there is occasion for making a gold shipment, the coin is prepared for that purpose in the rear office of that bank; here it is bagged and kegged and made ready for shipment. Kegs in which gold is packed—specie kegs, as they are called—are made of extra hard wood. They must have an extra iron hoop. Specie is not thrown loosely into a keg, nor, upon the other hand, is it carefully wrapped in tissue paper and piled up one upon another. The keg serves only as a protection for canvas bags, into which the coin is placed in the ordinary hit and miss fashion of pennies in a man's pocket. Into each bag goes $5000, and ten bags fill a keg. In the interest of security each keg is treated to what is technically known among the shippers as the red-taping process. At each end of the keg, in the projecting rim of the staves above the head, are bored four holes at equi-distant intervals. A piece of red tape is run through these holes, crossing on the head of the keg, and the ends finally meet in the center. At the point of meeting the tape is sealed to the keg's head by wax bearing the stamp of the shipper. Gold crosses the ocean very much as does every other kind of freight, without any special looking after. The average rate of insurance is about $2000 on a shipment of $1,000,000. There are shippers who do not insure. Having to ship $1,000,000, they give it in different parts to half a dozen different vessels. It is a strict rule with some firms never to trust more than $250,000 at a time on any one ship. A certain party furnishes all the kegs for gold and packs them. The man who does this is a monopolist in his way. Shippers of large amounts always lose a few dollars by abrasion, but not exceeding 16 ounces on a million dollar shipment. The only protection to be found against abrasion lies in the shipment of gold in bars instead of coin. Gold bars are not readily obtained.

Puts, Calls, Spreads, and Straddles.—"Of the fifty or sixty millions of people in this country," E. McCann, private secretary to the Hon. Russell Sage, said recently, "few know the correct definition of 'puts,' 'calls,' 'spreads,' and 'straddles.'"

A *privilege* isa contract by which the maker of it engages to purchase from the holderin the one case, or to sell to the holder in the other case, a number of shares of some specified stock, at a certain price, at any time within a certain period, at the option of the holder.

A "*call*" is a privilege bought of the maker at a certain price, and the owner of it is privileged to call for a certain amount of stock at a given price within thirty, sixty, or ninety days, or four or six months.

If a man holds a "put" he has the right to deliver to the maker of the privilege a stock at a certain agreed price within a number of days.

A "straddle" is a "put" and "call" combined. The holder of one may "put" stock to the maker of the privilege or "call" for it. That class of privilege comes high, because there is money in it whichever way the market may go. If the market does not go at all, but stands still, the maker is in the money he has been paid for the privilege, usually about three per cent. A "spread" is also a "put" and "call" combined, but there is this difference: A "straddle" is made at the market—that is to say, the maker of the privilege takes the risk that the stock in question does not move to any extent from the price at which it is selling when the privilege is sold. In a "spread" the maker has more leeway. If Western Union is selling at 70 the maker of the privilege sells a "spread" say of 67 and 80. If it goes below 67 the holder of the privilege can put the stock to the maker and corral the difference, and if it goes above 80 the holder of the privilege can call the stock from the maker at the price and reap the profits. But so long as the price of the stock keeps within those points the maker of the privilege is safe. To put it in another way, the holder of a "straddle" will make, if the market for the stock he is dealing in moves at all, whereas the holder of a "spread" does not make any thing until the market moves past certain limits.

In the spring of 1884 the holders of privileges written by Mr. Sage took nearly $5,000,000 out of him, but Mr. McCann said there was a heap of money for all cautious and shrewd makers of privileges in the long run. The seedy-looking men who peddle privileges on New street nowadays say that business is slow at the moment, as the makers of privileges ask too high for them. Privileges are now sold in cotton-seed oil certificates, petroleum certificates, wheat, cotton, eggs, butter, and coffee, as well as stocks, and several years ago, when the crop of fireworks for Fourth of July looked a little bit in doubt, owing to troubles between foreign and domestic manufacturers, privileges on rockets and cargoes of fire-crackers and pinwheels were hawked about Maiden Lane, the stamping-ground of the dealers in pyrotechnics in this city.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

PATENTS GRANTED TUESDAY, MARCH 29TH, 1887.

359,996. Process of and Apparatus for Making Carbon Dioxide. Samuel Cabot, Boston, Mass.
360,028. Apparatus for Loading and Unloading Ingots. Frank Le Blond, Joliet, Ill.
360,032. Metal-Cutting Machine. Bernard J. Malone, Brooklyn, N. Y.
360,036. Rolls for Rolling Girder Rails. Arthur J. Moxham, Johnstown, Pa.
360,047. Rail-Splice for Railways. Sutherland M. Prevost, Philadelphia, Pa.
360,079. Steam-Boiler Furnace. Joseph Anderson, Pittsburg, Pa
360,106. Anti Freezing Apparatus for Water Pipes. Edwin A. Newman, Washington, D. C., Assignor of one fourth to David L. Snediker, Emporia, Kansas.
360,107. Anti-Freezing Apparatus for Water Pipes. Edwin A. Newman, Washington, D. C., Assignor of one fourth to David L. Snediker, Emporia, Kansas.
360,172. Tube-Coupling. Abram Reese, Pittsburg, Pa.
360,182. Furnace. Ezra W. Vanduzen, Newport, Ky.
360,183. Frame for Power Drilling-Machines. John S. Wallace, Nelsonville, Ohio.
360,222. Gas-Producer. James A. Herrick and Charles R. F. Topham, Brooklyn, N. Y., Assignors to Henry Arthur Gadsden, London, England.
360,229. Pipe-Coupling. Richard H. Lapage, Bank Chambers, New Oxford Street, County of Middlesex, England.
360,238. Charcoal Kiln. James E. McNaughton, Manchester, Vt.
360,249. Gas-Generator. Antonio Ordonez y Ponce, Matanzas, Cuba.
360,251. Pipe-Mould. William Smith, Scottdale, Pa., Assignor of one half to Kenney & Co., same place.
360,260. Portable Dumping Apparatus. Gottlob Wartinger, Berlin, Germany.
360,273. Composite Pier for Bridges. August Borneman, Lancaster, Ohio.
360,288. Apparatus for Bending Tubes. Edward P. Follett, Rochester, N. Y., Assignor to James H. Kelly, same place.
360,311. Socket for Removing Tools from Oil-Wells. Arthur W. Lewis, Bradford, Pa.
360,312. Box-Coupling for Drilling Tools. Arthur W. Lewis, Bradford, Pa.
360,342. Centrifugal Separator. Jonathan Evans, Philadelphia, Pa., Assignor of one-half to David H. Burrell, Little Falls, N. Y.
360,343. Wire-Nail Machine. Louis A. Fontaine, Toledo, Ohio, Assignor of one half to Christian F. Collot, Chicago, Ill.
360,389. Gas-Regulator. James A. Lyon, Clarksville, Tenn., Assignor to William A. Hoeveler, Pittsburg, Pa.

METALLURGY OF STEEL.[a]

By Henry M. Howe.

(*Continued from page* 206.)

The views of several writers are summed up in the following table:

TABLE 3.—EFFECT OF CARBON ON TENSILE STRENGTH.[e]

Writer.	Kind of steel.	Tensile strength. Lbs. per sq. inch.			
Deshayes[d]	Unannealed steel	$T = 42{,}668 + 25{,}601\ C + 51{,}202\ C^2$.			
Thurston[a]	Unannealed " [f]	$T = 60{,}000 + 70{,}000\ C$.			
"	Annealed " [f]	$T = 50{,}000 + 60{,}000\ C$.			
Bauschinger[a]	Bessemer "	$T = 61{,}870\ (1 + C^2)$.			
Weyrauch[a]	Minimum values.....	$T = 52{,}625\ (1 + C)$.			
Salom[b]	Ordinary "	$T = 45{,}000 + 100{,}000\ C$.			
Gatewood[c]	When carbon is from..	·10 to ·2	·2 to ·3	·3 to ·4	·4 to ·5
	It increases tensile strength at the rate of	65,000	70,000	76,000	83,000
	When carbon is from..	·5 to ·6	·6 to ·7	·7 to ·8	·8 to ·9
	It increases tensile strength at the rate of	91,000	100,000	109,000	117,000
	When carbon is from..	·9 to 1·	1 to 1·1	1·1 to 1·2	
	It increases tensile strength at the rate of	117,000	100,000	60,000	

[a] Thurston: "Materials of Engineering," II., p. 420-1. [b] *Trans. American Inst. Mining Engineers*, XIV., p. 127. [c] Asst. Naval Constructor R. Gatewood, private communication. [d] *Annales des Mines*, 1879, p. 339. [e] C = the percentage of carbon present. [f] Minimum values.

These formulæ, as may be seen in Fig. 3, where their curves are plotted, are very discordant. Comparing them with each other, and with about 1500 cases, which I have plotted (many of which are given in Fig. 3), and which are gathered from many sources, the more firmly rivets the conviction that ultimate composition can no more in steel than in lithology or organic chemistry be an accurate and trustworthy index of physical properties, since in the one as in the others we find identical ultimate composition with very different properties.

Thus I find that with the same, or nearly the same carbon, the tensile strength varies in one case from 47,000 to 137,000 pounds per square inch; in another from 48,000 to 135,000, and in a third from 79,000 to 170,000; nor do I find any difference in the other variables sufficient to account for these enormous discrepancies. Nor, if we go a step farther and almost completely eliminate other variables, do we find concordant results. Thus Gatewood[b] reports three sets of most valuable results, whose salient features I have grouped in the following table:

TABLE 4.—SUMMARY OF GATEWOOD'S CARBON RESULTS.

Steel.	Number of heats.	Composition. Carbon. Maximum.	Carbon. Minimum.	Manganese. Maximum.	Manganese. Minimum.	Manganese. Average.	Phosphorus. Average.	Physical properties. Average Increase (+) or Decrease (−) per 1 per cent carbon. Tensile strength. Pounds per square inch.	Elongation. Per cent.
Chester...	130	·22	·10	·73	·20	·38	·05	+138.750	−42·5
Norway..	369	·31	·11	·64	·17	·38	·06	+ 41 900	− 7·8
Cambria..	120	·24	·09	·90	·18	·45+	·085 ±	+ 65,500	−13·3

In each of these three sets of tests the conditions appear to have been fairly constant, the only important variable being the carbon. The compositions were in other respects nearly constant, if we except the variations in manganese (which I shall endeavor to show has probably little effect on the tensile strength), as were the methods of testing and of preparing the test pieces. The inferences from these sets of observations, among the most valuable ever presented in view of their number and the constancy of their conditions, should be concordant; they are utterly discordant.

Thus the effect of carbon on tensile strength indicated by the Cambria results is 50 per cent greater, and that indicated by the Chester tests over 200 per cent greater than that of the Norway; its effect on elongation is nearly twice as great in the Cambria and more than five times as great in the Chester as in the Norway steel. I hold that these results indicate either a degree of carelessness and ignorance in the conduct of these tests hardly credible in these well (and in two cases admirably) ordered establishments, and on the part of the apparently intelligent inspectors; or, more probably, in view of like differences in the effects of carbon deduced from the enormous mass of results published by other observers, that the effects of carbon are not quantitatively constant.

In Fig. 4 Gatewood's results are graphically represented. While between the Cambria and the sinuous Norway curve, whose sinuosities have been artificially reduced by derivation, there is an approach to parallelism, both are abruptly crossed by the Chester curve. As each of these latter curves represents a greater number of heats than the Cambria, they rudely shake our faith in it. Curve 4, which I have derived from the results obtained at Chester after a change of *personnel* had removed apparent causes of discrepancy, is more nearly parallel with the others than the original Chester curve, but it implies an increment of 73,812 pounds tensile strength per square inch per increase of one per cent carbon, or nearly twice as much as is implied by the Norway curve.

The most important lesson of these results is that we must use the most extreme caution in drawing inferences even from extended data as to the effects of composition on physical properties.

The Cambria curve is so smooth that, representing as it does 130 results, even the experienced observer would be tempted to rely on its teachings. Yet here, as in so many similar cases, if we extend our observations they overthrow our apparently well established conclusions; these, then, should be considered authoritative only when based on an enormous number of observations, on steel from many sources and made under different conditions, since coincidences between composition and properties often result, not from the causal relation between them, but from some common unsuspected cause, whose effects may be eliminated by comparing steel produced by different methods and under different conditions.

In Fig 3 we note that the spots lie in a band which rises and rapidly widens as the carbon rises till it reaches, say, 1 per cent. The comparatively few cases whose carbon is between 1 and 1·5 per cent indicate that the tensile strength reaches its maximum with carbon about 1 per cent, which accords with common observation. The formulæ of Thurston, Gatewood and Salom run fairly through the most thickly dotted region, Thurston's being too high for low carbon steel (ingot iron), while Salom's is too low for carbon below 0·10. Troilius' figures are rather high, and those of Weyrauch and Bauschinger much too low except for low carbon steel.

While we can not accurately quantify the effects of carbon, I believe that for ordinary unhardened merchantable steel, the tensile strength is likely to lie between the following pretty wide limits:

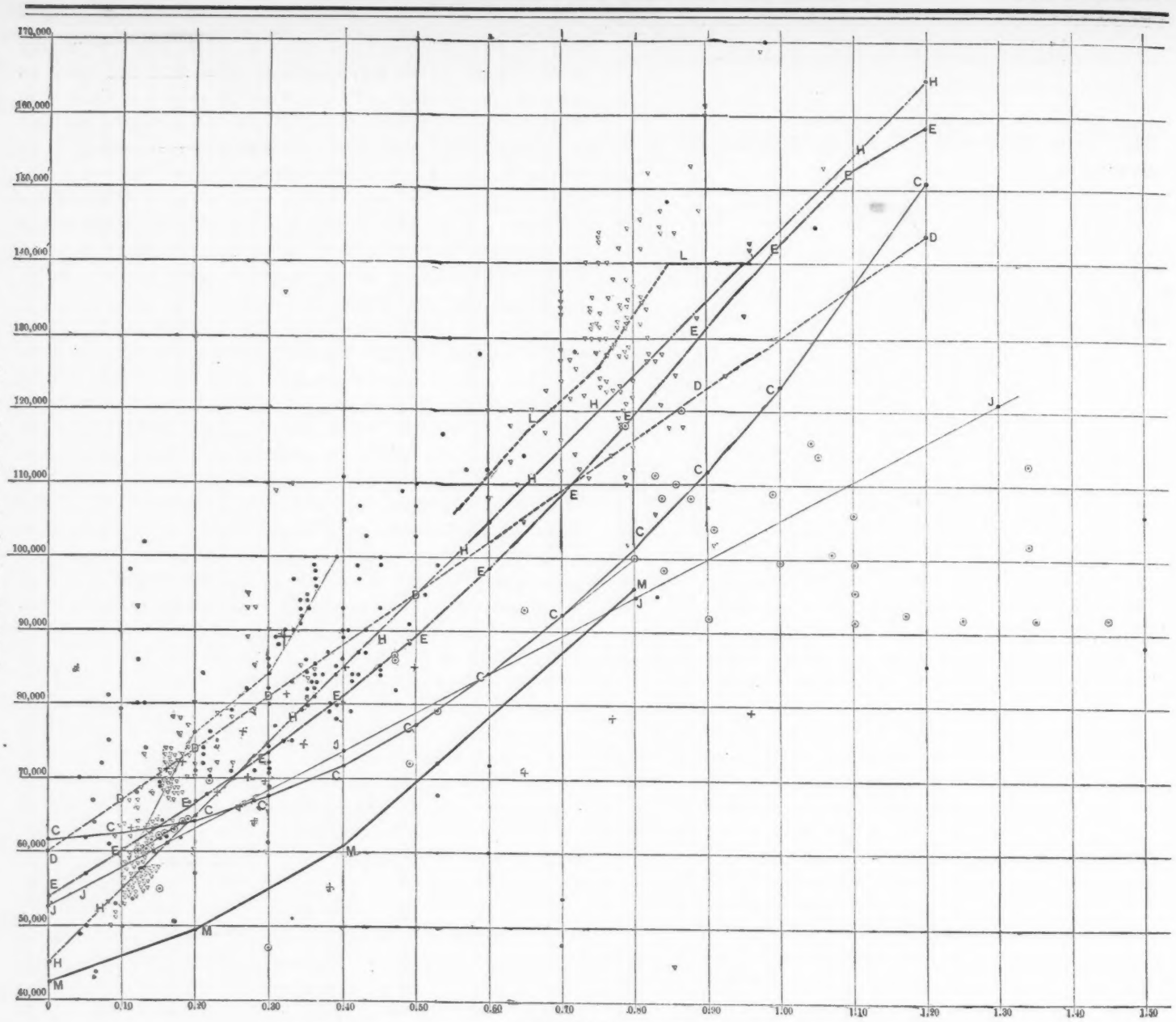
TABLE 5.—EFFECTS OF CARBON ON TENSILE STRENGTH.

Carbon. Per cent	0·5	0·10	0·15	0·20	0·30	0·40	0·50	0·60	0·80	1·00	1·20
Tensile strength Lbs. per sq. in. Upper Limit...	66,000	70,000	75,000	80,000	90,000	100,000	110,000	120,000	150,000	170,000	115,000
Tensile strength Lbs. per sq. in. Lower Limit...	50,000	50,000	55,000	60,000	065,00	70,000	75,000	80,000	90,000	90,000	90,000

§ 28. DUCTILITY.—The effects of the percentage of car-

[a] Copy-right by the Scientific Publishing Company, 1887.

[b] *Op cit.*



•=Chiefly Bessemer Steel.
⊙=Crucible Steel.
▿=Open Hearth Steel.
ǂ=Steel Castings, usually untempered.
C=Bauschinger's formula.
D=Thurston's formula.

FIG. 3.

E=Gatewood's formula.
H=Salom's formula.
J=Weyrauch's formula.
L=Average after Trollius.
M=Deshaye's formula.

bon on the elongation, for our purposes the most available measure of ductility because the most frequently recorded, are obscured by other variables even more strikingly than are its effects on tensile strength. Thus we find that in exceptional cases the elongation varies from 2·3 to 32 per cent with constant carbon; in another case from 0· to 29·3 per cent; nor, if we turn from exceptional cases to ordinary ones, do we find a closer approach to uniformity in elongation than in tensile strength. Thus in the Chester, Norway, and Cambria lots of steel investigated by Gatewood, and already referred to under tensile strength, we find that the loss of elongation per increase of ·01 per cent carbon is ·425, ·078 and 0·133 per cent respectively. (See Table 4.) I have plotted the results of over a thousand determinations with elongation as ordinate, carbon as abscissa, as shown in Fig. 5. We note that the thickly dotted region lies in a broad band, gradually declining as the carbon increases, its width showing that, where carbon is below 0·5, the elongation for given carbon in common merchantable steel often varies by 20 per cent of the initial length. With increasing carbon the elongation at first declines slowly, say from C 0· to C 0·2 per cent, then more rapidly till the carbon reaches say 0·5 per cent, and after this it again declines more slowly. I find that the empirical formulæ

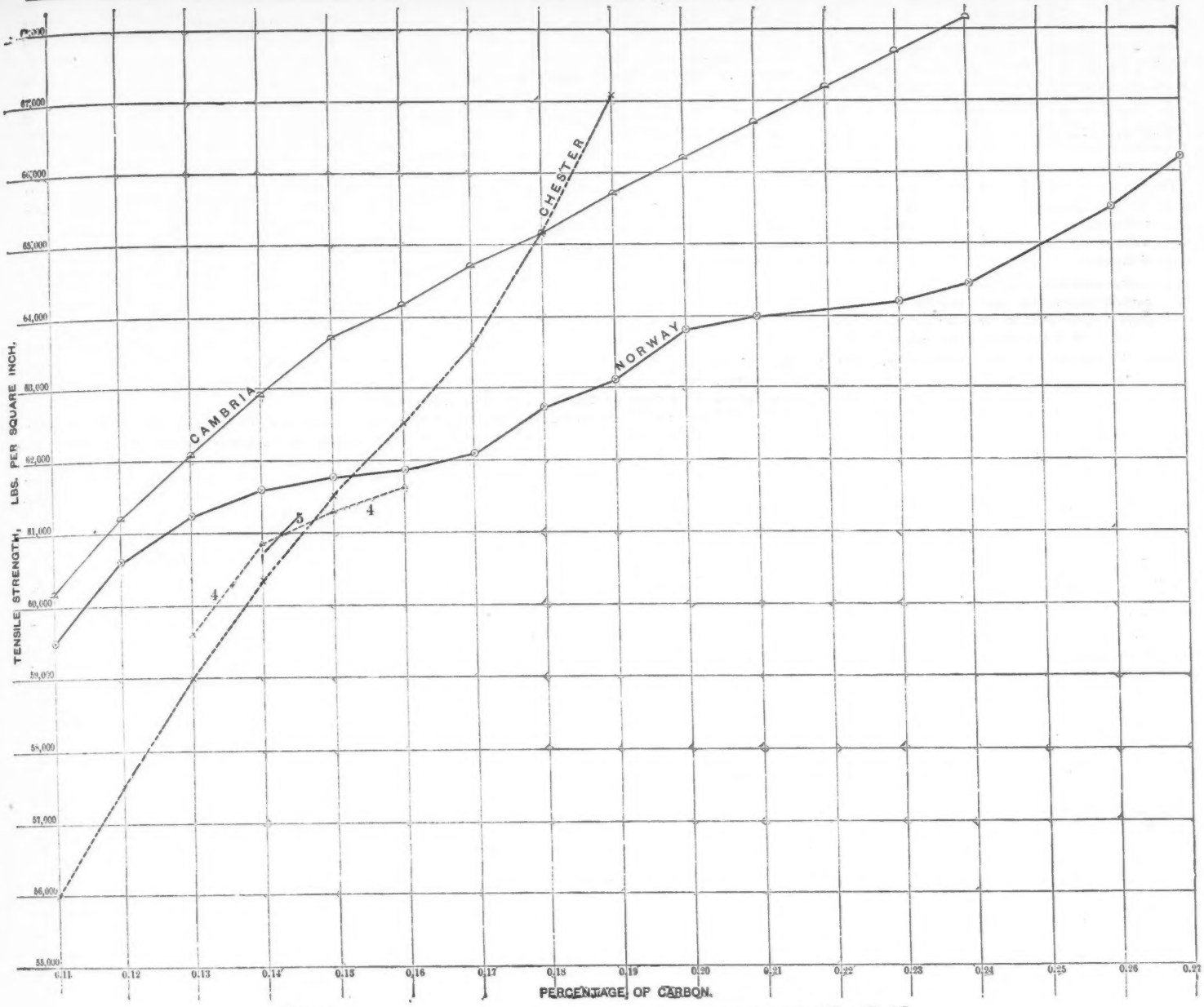
$$(A): E = 33 - 60\,(C^2 + 0{\cdot}1); \text{ and}$$
$$(B): E = 12 - 11{\cdot}9\,\sqrt[3]{C - 0{\cdot}5}$$

(In which E = per cent elongation in 8″ and C = per cent carbon)

give curves plotted in the diagram and running well through the most thickly dotted region, (A) applying when C is below 0·5 per cent; (B) when it is between 0·5 per cent and 1 per cent. Above 1 per cent the elongation diminishes very slowly. The following table gives the upper and lower limits which, judging from these instances, we are likely to meet:

TABLE 6.—EFFECT OF CARBON ON ELONGATION.

CARBON.		0·10	0·20	0·30	0·40	0·50	0·60	0·70	0·80
Elongation.	By formula.	26·4	24·6	21·6	17·4	12·	6·48	5·04	4·08
	Usual upper limit.	29·0	25·2	23·0	21·0	.....	10·0	7·5	6·0
	Usual lower "	17·5	15·0	12·0	.....	7·5	.....	2·5	1·5



△=Cambria.

⊗=Norway.

×=Chester.

FIG. 4.

4=△=Chester, Heat Nos. 670 a 767.

5=Curve derived from 4.

Deshayes, from study of an enormous number of European steels, proposes the formulæ[a]—

Elongation = 35 — 30 C, and

Elongation = 42 — 46 C, (here C = the percentage of carbon), for the percentage of elongation measured in 3·9 and 7·8 inches respectively.

There is little in the results I have plotted, either as to elongation or tensile strength, to support the popular belief that the properties of Bessemer steel correspond with those of open-hearth steel of lower carburization, which I incline to regard as a superstition, though without more prolonged study of our statistics, we can not wholly discredit it. The many cases in which the elongation and tensile strength of crucible steel fall, the one above, the other below the limits usual in Bessemer and open-hearth steel for given carbon, give color to the less often expressed belief that the properties of crucible steel of given carburization correspond to those of Bessemer and open-hearth steel of lower carburization. I also notice a fact which has not heretofore been brought to my attention, that the elongation and tensile strength of steel castings of given carbon, like those of crucible steel, correspond with those of Bessemer and open-hearth steel of lower carbon. While this may be due to plotting an insufficient number of cases, it occurs to me that this similar behavior of crucible steel and of steel castings may be due to their both containing more silicon than Bessemer and open-hearth steel, silicon opposing the effects of carbon.[b] The greater freedom from phosphorus of crucible steel and often of steel castings is another possible explanation.

(TO BE CONTINUED.)

NOTE.—The publishers of the ENGINEERING AND MINING JOURNAL will thank the readers of this article if they will promptly call attention to any inaccuracies they may observe in it.

[a] *Annales des Mines*, 1879, p. 339.

[b] Muller, J. I. and S. I., 1882, I., p. 374, concludes that Si has an effect opposite to that here suggested, raising the tensile strength.

CORRECTION.—In Table 2, page 224, the Dannemora blister steel contains 0·009 per cent of manganese. The carbon as Fe_3C in the steel exposed for fifteen minutes to a blue heat is 15·4 to 22·0 per cent, and in that exposed to a blue heat for six hours it is 41·9 to 42·9, their average being 33·0 per cent.

PERSONALS.

Mr. F. M. Taylor, of Taylor & Brunton, mining engineers, has returned from Leadville, Colo., and will leave for England next week on professional business.

H. A. Whiting, mining engineer, of this city is returning to California on professional business and will remain for some time at the Palace Hotel, San Francisco.

The *Mail and Express* publishes by far the best reports of the mining stock market of any New York daily. Its reports are well written, impartial, and accurate, and add greatly to the value of the paper.

The *Miner and Manufacturer* is the name of a very ambitious newspaper published in Milwaukee, Wis., and devoted largely to mining matters. No doubt it owes its existence to the interest in mining created by the great Gogebic iron ore mines, and we wish it a success measured by the standard of a Gogebic bonanza.

FURNACE, MILL, AND FACTORY.

The Sloss Iron and Steel Company, Birmingham, Ala., will hold a meeting on April 7th, to consider increasing their capital stock $1,000,000.

The shops of the West Bergen Steel-Works, of Jersey City, N. J., recently destroyed by fire, have been replaced by new buildings, now ready for occupancy.

The Roller Chain Belting Co., of Columbus, O., report that their sales are on the increase, and with their facilities for manufacturing, are able to ship promptly.

Messrs. Montague & Company, Chattanooga, Tenn., have put up grinding works for preparing the Chattanooga china clay for market. They will also double the capacity of their fire-brick works.

Atlanta Bridge and Axle Company has been organized, at Atlanta, Ga., with a capital stock of $150,000 to operate the Atlanta Bridge-Works. Other specialties in iron and steel will be added to these works.

The Reliance Wire Company has been organized at Milwaukee, Wis., with $20,000 capital stock. Its purpose is to manufacture and deal in wire of all kinds and wire goods. The incorporators are Frank A. Hall, W. N. Fitzgerald, and Oscar F. Lindman.

Messrs. Henry Disston & Sons have decided to increase their steel plant at Tacony, Pa., and are now actively preparing plans and arranging for the erection of an 18-inch bar train and a 9-inch guide mill. This will increase their steel-rolling capacity about one third, and put them in a position to make merchant sizes of bar steel, which heretofore they have been unable to produce.

The new bloomery of Messrs. Morrison Bros. & Co., at Anniston, Ala., will have a capacity of 20 tons daily. The product will be a high grade of iron for cotton ties, horse-shoes, car axles, boiler plates, etc. The owners will add a train for reducing to proper dimensions these goods. The location of the bloomery is within the corporate limits of Anniston, between the Georgia Pacific and Anniston & Alabama railroads.

The Department of State has received information from the Consul at Milan, Italy, that there will be held in that city, in May and June, an international exhibition of flouring mill machinery, rice dressing and similar industries. The Consul advises American manufacturers to send exhibitions. He states that American machinery enjoys a high reputation in Italy; that especially hydraulic wheels and turbines and windmills are well and favorably known to the educated specialists, both for their excellence and comparative cheapness.

A one half interest in the Lauth Iron-Works, at Howard, Pa., has been sold to a Chicago syndicate. The works include three furnaces and a rolling-mill. The price paid is said to be $100,000. The original owner, Bernard Lauth, and his son, John Lauth, retain a one half interest. The $50,000 to be paid on the first of April will be immediately devoted to improving and putting the works in operation, as they have been idle for several years. They will manufacture steel by the Bessemer process and iron of the best grade. Mr. John Lauth will be the manager of the company.

The Sanderson Steel-Works in Geddes, a suburb of Syracuse, N. Y., were destroyed by a fire on the 28th inst. The total loss is estimated at $100,000, and will largely depend upon the condition of the furnace hammers and other furnishings. There was not a large amount of finished steel on hand. The steel-works were owned by English capitalists entirely, being a branch of the Sanderson works, of Sheffield, England. The works will be rebuilt immediately, and will be a third larger than those burned. The fire is supposed to have originated in the gas generating system through some defect.

The nail-machine and nail-plate shears of the Steubenville Co-operative Nail-Mill have been sold to the Jefferson Nail Company, of Steubenville, Ohio, for $4000. This plant was organized by the locked-out nailers of the Mingo and Jefferson mills at the commencement of the late strike. The plant worked double turn very successfully for several months, when the parties who were furnishing iron, influenced, it is said, by the Western Nail Association, raised the price of iron to such an exorbitant figure as to squeeze the new concern out of existence. The plant finally closed down on January 6th, 1886.

Baltimore and Pennsylvania capitalists have purchased 1200 acres on the Patapsco River, near Baltimore, Md., for the purpose of establishing extensive steel-works. Steel rails and all varieties of commercial steel will be made, and steel ships built. A corps of engineers is at work laying out the ground. Wharves, docks, shops, and furnaces are to be constructed. The Patapsco is to be dredged to give deep water for the large steamers. The Pennsylvania Railroad will extend the Philadelphia, Wilmington & Baltimore tracks to the property, and will have the railroad transportation that the establishment will furnish.

CONTRACTING NOTES.

CONTRACTS OPEN will be found on page xix. New Contracts this week: No. 270, Engines, Boilers, and Foundations; No. 271, Granite; No. 272, Light-house Supplies; No. 273, Constructing and Grading; No. 274, Breakwater; No. 275, Reservoir; No. 276, Engines; No. 277, Dredging; No. 278, Electric Lighting; No. 279, Iron Beams; No. 280, Pumping-Engines; No. 281, Drilling Oil Wells.

The Aqueduct Commissioners have decided to reject all bids for the construction of new shaft 13½ on account of informalities in the bids of the lowest bidders. It was decided to again advertise for fresh bids for the work.

The Gas Trust, Philadelphia, Pa., has awarded a contract to the McNeal Pipe and Foundry Company for furnishing the Department with 1,500 lengths of 4-inch pipe at 28 cents per foot.

The bids received for an iron bridge over the Patapsco River near Ilchester, between Baltimore and Howard counties, Md., ranged from $3193 to $4284. The contract was to be awarded April 1.

G. W. Bolinger, Jonesboro, Tenn., is in the market for lathes, planer, pulley, shafting, and wood-working machinery.

Messrs. W. Ferguson and J. A. Fambro, Rockmark, Ga., wish to negotiate for a 20 horse-power engine on sills, and double surface planer about 20 inches wide, with matcher about 8 inches wide, and re-saw, and scroll-saw.

C. R. Wood, Columbus, Miss., is in the market for brick machinery.

The town of Gallatin, Tenn., contemplates erecting water-works, and have applied to the Legislature (now in session) for authority to issue $40,000 of bonds for the purpose of erecting and equipping water-works for the town.

The contracts for furnishing 400,000 pounds of iron castings for the Water Board, Boston, Mass., were awarded to S. B. Locke & Co. at 2·15c., and for 300,000 pounds service box castings at 2¼c.

The plans for the new universal mill to be erected by Carnegie, Phipps & Co., adjoining their steel plate mill at Homestead, Pa., are now complete, and bids for the work are invited. This is the mill which the company intended to erect with a view to filling the government armor plate contracts, and, although it finally decided not to bid for the work, the mill will still be adapted for that class of work. The horizontal rolls in the universal mill will be 72 inches long and 32 inches in diameter, with special provisions made to put in longer rolls if necessary. The vertical rolls will be 20 inches in diameter and 48 inches long, with tables 37 feet long on each side, consisting of exceptionally heavy rollers and massive driving gear.

The vertical and horizontal rolls will be separately driven by independent engines of special design, which are now being made by G. P. Allis & Co., of Milwaukee. The pair of engines driving the vertical rods will be 30 inches in diameter of cylinder and have a 54-inch stroke. Those for the horizontal rolls will be 40 inches in diameter of cylinder and have a 60-inch stroke. The heating furnaces, of which there will probably be six, will probably be operated by Julian Kennedy's patent charging crane, which is now operating successfully in the plate-mill. A special hydraulic shearing machine will be used.

The rolls will be capable of rolling ingots up to 30 tons weight. The capacity of the mill will vary greatly according to the class of steel produced, but it will exceed that of any universal mill in the word.

The Mexican Iron Mountain Manufacturing Company, of Durango, Mexico, has contracted with the Lewis Foundry and Machine Company, of Pittsburg, Pa., for the entire machinery for a well equipped rolling-mill.

J. Stewart Allam, of South Bethlehem, Pa., has contracted to erect a steel plate-mill at Ferndale, near Allentown, for the Catasauqua Manufacturing Company. The works are on the line of the Lehigh Valley Railroad, a siding from which is being built to the site of the new structure.

LABOR AND WAGES.

The New Jersey Steel and Iron Company, Trenton, N. J., has announced a change in the schedule of wages, the effect of which is to grant an average increase of 5 per cent.

The strike of the Bangor Consolidated Slate Company, Bangor, Pa., to which we referred in our issue of February 19th, is at an end. The men have grown tired and are willing to resume work on the old basis. The company did not make any concession to the men.

Stewart Bros. & Co., of the Beaver Fire-Brick Company, Beaver, Pa., advanced the wages of their workmen 10 cents per day March 28th. The men had demanded the advance, to take effect April 1, but the firm in granting it gave them the benefit of the few previous days.

The coal miners and coke laborers at the Monastery Works, Latrobe Coal Company's mines and the works of the Ridgeway and St. Clair companies Latrobe, Pa., struck on the 30th ult. for an increase of five cents per ton, and the coke drawers twenty cents per ton. The operators have refused to grant the demands, and the works are all idle.

District Assembly No. 7002, Knights of Labor, composed of iron-workers, has requested the proprietors of all iron establishments in Reading, Pa., to grant an increase of 10 per cent in wages, on the ground that the employés should be benefited by the prosperous condition of the iron trade. About 2000 men are interested in the request. The proprietors of the Reading Iron-Works have advanced the wages of the puddlers from $3.75 to $4 per ton, and all others advanced 4 per cent. The proprietors have until the 2d inst. to make answer. It is said that the request will not be generally granted.

It has always been customary for employés of railroads and other corporations in Pennsylvania to assign their wages in advance to storekeepers or others for the purpose of obtaining credit or money, pending the company's pay day. James Wooding, an employé of the Lehigh Valley Railroad Company, sold his time for a month to a storekeeper in Northampton County, and the company paid the storekeeper the man's wages on presentation of the assignment on pay day. Wooding, acting on legal advice, demanded his pay for the month on the ground that the assignment was not legal, because the thing assigned had no existence at the time, and there was no transfer of property. The demand was refused and the matter was carried to the Northampton County Court, which decided in favor of the points raised by Wooding. The railroad company carried the case to the Supreme Court, and that court has just affirmed the judgment of the lower court in a decision establishing the fact that no assignment of wages to be earned can be legal. As a majority of railroad employés in this State sell their time, this decision is a matter of great importance to them as well as to time buyers and the companies. Some time buyers have made fortunes in the business, as they obtain large discounts for the accommodation.

GENERAL MINING NEWS.

SOUTHERN NATURAL GAS AND OIL COMPANY.—One of the most extensive schemes for the development of what has hitherto been considered wild land in West Virginia and neighboring counties in Kentucky and Tennessee, has just been perfected by the organization of the Southern Natural Gas and Oil Company. The mineral privileges cover 6839 acres of land in Cabell County, 13,050 acres in Logan, 26,668 acres in Jackson, 43,826 acres in Putnam County, West Va., and 22,826¼ acres in Johnson and Lawrence counties, 11,500 acres in Greenup County, 28,216 acres in Wayne County, and 27,650 acres in Martin County, Ky,; 23,456 acres in Fentress County, Tenn., and 2,575 acres in Lawrence County, Ohio. Upon this land the company has issued $100,000 of first mortgage and $4,000,000 of second mortgage bonds, and this money will be used in the early development of the mineral resources of the property.

ALASKA.

Reports state that the gold fever is setting in early notwithstanding a most severe winter. One hundred men have started from Yukon already, and many others are ready to start. Petroleum beds are rumored to have been found near Juneau. The gold prospectors are preparing to scatter in all directions in the spring. The Alaska Mining Company is about to start new mills near the celebrated Treadwell mine of Douglas Island.

ARIZONA.

PINAL COUNTY.

SAMPLE GROUP.—St. Louis parties have purchased this group, adjoining the Silver King. There are a number of shafts, the deepest being 100 feet, on the property, and all are said to be in ore. A company has been organized and the stock placed at twenty-five cents per share; $37,500 has gone into the treasury as a working capital. The company will immediately place machinery upon the property and begin active work.

BRITISH COLUMBIA.

The Department of the Interior, Ottawa, is completing arrangements for a geological and topographical expedition to the gold fields of British Columbia, ying on the Alaskan frontier. The expedition will set out in May, and its work will extend over two years, the idea being that the party shall explore the entire country and prepare a full report for Parliament on its resources and conditions.

CALIFORNIA.

NEVADA COUNTY.

BRUNSWICK GOLD MINING COMPANY.—This company, to which we referred in our issue of January 22d, is now receiving subscriptions to the 50,000 shares of the working capital at $1 per share, through Wells, Fargo & Co., and as soon as this is closed out the stock will be listed on the Consolidated Stock and Petroleum Exchange in this city.

The property of this company is situated on Union Hill, Grass Valley. Work will be immediately commenced on the mines, and it is expected the 20-stamp mill will be ready to start up by the 15th inst.

COLORADO.

CHAFFEE COUNTY.

MARY MURPHY.—The company intends to drive another tunnel to further develop its property. This will be started nearer the base of the mountain, 560 feet below the lowest tunnel it now has. It will be driven in a distance of 3300 feet to strike the vein.

CLEAR CREEK COUNTY.

Mr. Hanson, who was the chemist at the recent trial of the Hartsfeld furnace at Buena Vista, says the Leadville *Herald-Democrat*, reports that another of a similar pattern has come to grief at Idaho Springs. In fact, it was never started up. The stack was of the same size as that used by the Cornucopia Company, to which we referred in our issue of February 26th, and about 130 tons of ore had been provided for the run. The mineral was of a highly siliceous character, without either lead or iron in its composition. It was discovered that no suitable flux could be obtained nearer than Leadville, and hence the furnace was never blown in. It is also stated by Mr. Hanson that, on the score of expense, the Hartsfelds are no cheaper than the water jackets in common use, and require same power and machinery to run them. It also develops that when the samples of slag, assayed by Mr. Burlingame, of Denver, were taken the stack had been fed with slag for an hour previous.

LAKE COUNTY.

DINERO.—The erection of a concentrating plant of 50 tons daily capacity is under consideration.

DAKOTA.

LAWRENCE COUNTY.

MUGWUMP.—The company has ordered new hoisting machinery.

RATTLER.—This company has purchased the machinery of the Mugwump Company, consisting of a 50 horse-power boiler, 45 horse-power double engine hoist, for $3400. It is unofficially stated that the Iron Hill company will bid for the ore, thus obviating any necessity for shipping it.

IDAHO.

ALTURAS COUNTY.

BELLEVUE-IDAHO.—The Queen of the Hills mine, owned by this company, which had not shipped ore for sixty days, owing to the absence of a satisfactory contract with the smelters, has resumed operations, and is sending out 36 tons per day.

BIG CAMAS MINING COMPANY.—This company has been organized at Salt Lake City, with a capital stock of $2,500,000; shares, $25 each. The officers are: W. L Pickard, president; P. L. Williams, vice-president, and L. H. Farnsworth, secretary and treasurer.

The company owns the Camas No. 1 mine, situated in Mineral Hill mining district; also the Big Camas Fraction mine. The same joins the Big Camas mine on the east.

STEMWINDER.—Mr. Van B. De Lashmutt, President of the Metropolitan Bank, Portland, Oregon, has purchased the Stemwinder mine, located at Wardner, in the Cœur d'Alene region, for $60,000. When navigation is opened it is expected that large quantities of ore will be shipped for reduction.

ILLINOIS

INDEPENDENT GOLD MINING COMPANY.—This company has been organized at East St. Louis, with a capital stock of $100,000, by Noble W. Mountain, Robert S. Raw, and Charles H. Billings.

COLES COUNTY.

Parties in Charleston have subscribed $3000 for sinking wells here for natural gas, which, it is said, has been struck in different places in this county during the past thirty years.

KANSAS.

MIAMI COUNTY.

PAOLA NATURAL GAS COMPANY.—The new machinery for this company has arrived. This new outfit the company intend to use in the drilling of their 2000-foot well, one mile from Paola, in the Boon field.

MEXICO.

CONCEPCION.—A meeting, held in St. Louis on the 24th inst., was for the purpose of subscribing to 50,000 shares of treasury stock which the company desired to sell to raise money to double the milling capacity. This company is operating the Concepcion y Anexas mines in Tlalpujahua. There is a twenty-stamp mill at work on the property, and twenty additional stamps will be added. The stock was all subscribed for by the stockholders at $1 per share.

MISSOURI.

LAFAYETTE COUNTY.

A practical test of making coke from Missouri coal has been made at Higginsville, and has proved successful. J. H. Campbell & Co. will at once erect fifty ovens, the Higginsville Coal Company will also place a contract for fifty, and there is a probability of more by some of the other coal companies.

VERNON COUNTY.

While boring a well ten miles northwest of Nevada, coal oil was struck at a depth of sixty-five feet last week. One drill passed through a heavy flint rock before the oil was reached; below the oil is twenty feet of sand rock, then a stratum of soapstone. One drill has now reached a depth of ninety-five feet.

MONTANA.

SILVER BOW COUNTY.

ALICE GOLD AND SILVER MINING COMPANY.—At a special meeting of the board of directors of this company, held at Salt Lake City for the purpose of meeting Mr. W. S. Dunn, a large stockholder, who presented a request from some of the New York stockholders, representing nearly 100,000 shares, asking that they would consider the propriety of the purchase of several mining properties belonging to the Walker Brothers in liquidation, consisting of the Rising Star, Walkerville, Blue Wing, and Midnight mines, the board, after a careful consideration, desired to learn from the owners their wishes, as owners of the property, and also as large holders in the Alice Company's stock, in fact representing nearly five eighths of the entire capital stock. They made the proposition to the board in the form of an option or call on the property on three (3) years' time for a sum of about $1 0,000, which was accepted, the Alice Company taking immediate possession, who will work the properties, charging $23 a ton for mining and milling the products, and whatever net which is paid to Walker Brothers to go as part payment. The company assumes no liabilities or responsibilities, but has the option to terminate the arrangement at any time. Such an advantageous contract can not help but result favorably to the company. The terms of the payment are very fair, but whether a good thing for the stockholders or not depends on the actual value of the property. Thus far no expert opinion has been made public. A report is called for.

MINERS' UNION.—In the case of Mattingly and others *vs.* Lewisohn, the Miners' Union quartz claim, situated a short distance northwest of the Bill, the jury brought in a verdict to the effect that neither plaintiff nor defendant is entitled to possession of the ground in controversy; that neither succeeded in proving a title to it. Immediately after the premises in dispute had three new location notices stuck up on it.

JEFFERSON COUNTY.

PENN PLACER MINING COMPANY.—This company has been incorporated with a capital stock of $1,000,000, shares $5 each, to work the placer ground known as the Jacks' Creek placers in Basin District. The claim comprises about 160 acres. Mr. E. G. Spillsbury, mining engineer, has just examined the property for Philadelphia parties. It is said that his report is favorable, and that the Philadelphia parties are considering an investment.

NEVADA.

ESMERALDA COUNTY.

MOUNT DIABLO.—The new mill erected at Soda Springs was to start up April 1st. Since the company ceased milling some months ago, it has mined and stored a large amount of ore.

STOREY COUNTY—COMSTOCK LODE.

We condense the following from the Virginia City *Chronicle*: It is stated on fairly reliable authority that the Gold Hill mines management have threatened to suspend the extraction of ore altogether unless the V. & T. Railroad Company reduces the cost of transportation of ore to 50 cents per ton, and furnishes fuel and lumber for timbering in the mines at less rates han now charged. This course is said to have been decided upon by the management on account of the low-grade ore now produced.

ANDES.—Occasional bunches of high-grade ore are encountered in opening up the 200 level. The 300 level is being opened up to explore the downward extension of the development on the 200.

BEST & BELCHER.—The region through which East crosscut No. 2 from the north lateral drift on the 1500 level is being extended is far east of any former explorations in the mine.

BULLION.—A streak of low-grade ore uncovered by a cave in the west drift on the 200 level is being followed.

CONSOLIDATED CALIFORNIA & VIRGINIA.—The official report for the week ended the 19th inst., shows that 917 tons of ore were shipped to the Morgan mill, 1730 tons to the Eureka mill. The average assay value of all the ore worked at both the above mills, according to battery samples, was $33.12. Bullion valued at $61,090.09 was shipped to San Francisco on the 21st inst.

SAVAGE.—Bullion shipments the current month foot up $16,758.25. The west cross-cut from the south drift on the 800 level is showing quartz giving low assays. The alleged ore development on the 1200 level proves to be of considerable importance. The development was made in extending west cross-cut No. 2 from the north lateral drift on the 1200 level. The ore so far is bunchy, but is high grade, assays ranging from $9 to $70 per ton.

OHIO.

The Ohio & Northwestern Railroad, formerly known as the Cincinnati & Eastern, running from Cincinnati and Portsmouth 100 miles up the Ohio River, is being changed to standard gauge. It is the intention to build an extension to Pomeroy, a distance of 50 miles, through the coal-fields, and to make the road an

important coal carrier. It will connect at Pomeroy with the Ohio & Kanawha Railroad, which penetrates a section of West Virginia which is rich in timber and minerals.

NATURAL GAS.

MANUFACTURERS' GAS COMPANY.—A big well was brought in on the Miller farm, near Canonsburg, last week.

PHILADELPHIA COMPANY.—The company has struck a well on the Howard farm, in the Murrysville District.

WASHINGTON NATURAL GAS COMPANY.—The company has just finished cleaning out the famous old McGugin well, near Hickory, and drilling it deeper, with highly satisfactory results. The well is flowing nearly as strong as it did four or five years ago, says the Pittsburg *Times*, when people traveled for miles from all directions to see it. It will be turned into the company's main line at once and used to supply the West End mills. It is believed that the flow will be permanent, as it had stopped not so much on account of the gas giving out, as from the fact thas the well had become clogged up and needed drilling out.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to March 26th:

	1887. Gallons.	1886. Gallons.
From Boston	1,172,520	672,177
Philadelphia	28 679.790	26,414,307
Baltimore	1,894,689	2,601,622
Perth Amboy	3.365,516	718,086
New York	76,953,290	86,301,315
Total exports	112,065,805	116,709,507

OREGON.

BAKER COUNTY.

MARYSVILLE.—This company, owners of the great Auburn canal at Auburn and much valuable placer ground, is now making preparations to commence the eason's work at an early day.

POCAHONTAS.—The company is working the extension of the Tom Payne mine on a large scale. They have sunk a shaft to the depth of over 70 feet, and a tunnel of over 150 feet is now being run in to tap the shaft. The vein averages over four feet in width. If the mine continues showing up satisfactorily, a mill will shortly be erected.

TOM PAYNE.—On this mine a large amount of development work has been done. The owners are contemplating the erection of a mill, having heretofore worked the ore by means of arastras.

PENNSYLVANIA.

COAL.

DELAWARE & HUDSON CANAL COMPANY.—A cave in occurred over the workings of this company's Milk Creek Colliery, in Plains, on the 27th ult., and the ground settled about four feet. Several pieces of property were greatly damaged. Cracks eighteen inches in width can be seen on the surface of the ground, and there are indications that there will be another and more serious cave-in before many days.

Very little damage was done to the colliery, the workings where the cave-in occurred having been abandoned.

DELAWARE & HUDSON COMPANY.—By an explosion of gas in the Vonstorck colliery of this company, at Scranton, on the 30th ult., two men were killed and many injured.

FAIRMOUNT COAL COMPANY.—An extensive cave-in took place at Pittston on the 28th ult., by which the Fairmount Colliery, owned by this company, and now operated by Dr. J. N. Rice, of Scranton, was totally ruined. It is stated that the ground all around the mouth of the shaft, over an area of about three acres, sank down in some places a depth of nearly twenty feet, and vast holes and crevices appeared on the surface.

The breaker, an enormous wooden structure, stands close by the shaft, and was terribly racked and twisted, so that it seems a miracle it did not collapse. The rear portion was torn completely away from the main building, which inclines at an angle of about sixty degrees. The Delaware & Hudson Railroad tracks, which pass close by the breaker, sank down about twenty feet.

The sinking of the surface was the result of extensive pillar robbing the "fourteen-foot" vein, which lies nearest to the surface.

CLEARFIELD COAL COMPANY.—It is announced that the Jersey Central Railroad has made a contract with this company for handling its coal. This will involve the building of a new dock at Communipaw that will cost about $500,000, the contracts for which have already been given.

HILLSIDE COAL COMPANY.—The Consolidated mine of this company at Pleasant Valley took fire on the 28th inst., and the flames spread with rapidity. For hours the men fought the flames, and at 2 o'clock P.M. the flames were under control.

PENNSYLVANIA COAL COMPANY.—Colliery No. 9 of this company, at Pittston, was flooded on the 26th ult. A number of years ago an abandoned portion of the mine was dammed up and had become filled with water. On Saturday, about 8 P.M., the dams gave way and a vast body of water began pouring into the mine. It was with the greatest difficulty that the mules were got out alive. On Sunday morning, the water had risen to a height of nearly 100 feet in the shaft. A large quantity of valuable machinery, pumps, and tools will be ruined. The company will at once proceed to pump out the water and get the colliery in working order again, but it will be a work of months.

NATURAL GAS.

The natural gas companies of Pittsburg are treating the assessment on their pipe lines, to which we referred in our last issue, with silent contempt, and it is expected that there will be some legal fights before any city taxes are paid on them. The limit of time for taking appeals from the assessments expired several days ago, and none of the companies appealed, as that would be acknowledging the city's right to tax them. The matter has been placed in the hands of the companies' attorneys and nothing more will be done until the city attempts to collect the tax, when the case will be tested in the courts.

TENNESSEE.

HAMILTON COUNTY.

CHATTANOOGA LAND, COAL, IRON AND RAILWAY COMPANY.—This company has been organized at Chattanooga, with a capital stock of $12,000,000. The company has purchased 25,000 acres of land in and around Chattanooga, including 10,000 acres on Walders Ridge, famed for the richness of the mineral deposits. A contract has been let for the immediate building of a railroad to the top of the ridge, giving the first railroad connection to Cumberland Table. Cars are to be running in four months. Three bridges will be built across the Tennessee River; two blast-furnaces and 500 coke-ovens will be immediately erected, and four other furnaces are being contracted for. The officers are: J. W. Adams, President; T. G. Montague, Vice-President; and H. Clay Evans, Secretary.

SODDY COAL COMPANY.—A syndicate of Cincinnati capitalists has just purchased this company's property. The price paid is not known, but it is understood to have amounted to more than $1,000,000. E. Zimmerman, the President of the Cincinnati, Hamilton & Dayton Railroad Company, is one of the principal stockholders. The property sold includes all lands owned by the company, except at Sale Creek and in Arkansas, together with the leased lands, mineral rights, etc., which amount in all to 8580 acres; 1805 in fee simple, 6065 operated under lease with 94 years to run, and 649 acres in which the company owns the mineral rights. It also includes the coal yard in Chattanooga, wharf privileges, store-houses, mines, etc., all the office fixtures, and personal property of the company.

TABLER-CRUDUP COAL AND COKE COMPANY.—The company has 26 ovens in course of erection. They will be finished by the end of April.

TEXAS.

EL PASO COUNTY.

EL PASO SMELTING WORKS.—Another smelter plan is on foot at El Paso. Robt. S. Towne, a member of the Mexican Ore company, which has ore sampling works in that city, states that the above company has recently purchased a site two miles above El Paso. The works will be constructed to provide for eight blast-furnaces, but only three blasts will be put in at present. The company asks no donation from the city.

UTAH.

Natural gas is now being used at the salt-works at Lake Shore, the old Utah Central bathing resort, for the purpose of making salt. The experiment has only been recently tried, but so far it has proven a success. The method employed is the vat principle. The water is pumped from the lake into a vat, raised a few inches higher than the one in which the salt is made. The two are connected by a pipe, the mouth of which is protected by a fine wire sieve, which prevents any foreign matter entering the lower vat. Underneath the lower vat which is 12 feet by 5, and 14 inches deep, four large jets of natural gas are placed. The gas wells were struck, it will be remembered, accidentally, while the owners were driving for water.

BEAVER COUNTY.

HORN-SILVER.—This company is shipping small lots of ore, and is doing a little work on the lower levels, according to the Salt Lake papers.

SALT LAKE COUNTY.

YOSEMITE MILLING AND MINING COMPANY.—This company has been organized at Salt Lake City, with a capital stock of $1,500,000, par value $5 per share, to work the Yosemite group of mines, consisting of the Yosemite, Yosemite First West Extension, Hyaspes, Gibraltar, and Grenada mines, and to purchase the Yosemite mill-site, together with hoisting-works, buildings, etc. All the mines are well known as being large ore producers, and in the Yosomite, the principal one of the group, a fine vein of ore is in sight in the bottom of the shaft. The principal office will be at Salt Lake City. The officers are: Maurice M. Kaighn President; Alexander Majors, Vice-President; Wm. S. McCormick, Treasurer; Wm. J. McIntyre, Secretary.

WASHINGTON COUNTY.

STORMONT.—Official information states that a very handsome streak of ore has been struck, running very regular in 6th level north, right across the drift, and 3 or 4 inches thick, without change for several weeks past. We also learn the very important fact that the principal ore-body in the California mine adjoining the Stormont Mining Company's property is approaching their south end line. It is now only 175 feet from it on the 7th level. Drifts will be pushed in that direction as fast as they can be worked to advantage.

VIRGINIA.

Col. Holland, President of the Virginia & Kentucky Railroad; A. S. Buford, President of the Virginia Western; J. D. Blair and W. N. Ruffin, have purchased thirty-three thousand acres of mineral and timber lands on the Round Mountain, east of Burk's Garden, for $115,500. This land contains brown hematite and specular iron ores of remarkable richness. They have also purchased twelve thousand acres of coal land on the Beech Fork and other branches of the Dry Fork of Tug River, at the price of $30,000. Each of these tracts of land is situated near the base line of the projected Virginia Western Railroad, of which Col. A. S. Buford is President. The twelve thousand acres of coal lands situated in a direct line about fifteen miles west of Pocahontas are a part of the same vein being worked at that place.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, April 1st.

Statistics.

Production Anthracite Coal for week ended March 26th, and year from January 1st:

TONS OF 2240 LBS.	1887. Week.	1887. Year.	1886. Week.	1886. Year.
P. & Read. RR. Co.	140,479	1,600,742	221,395	2,248,911
Cent. R. R. of N. J.	120,684	972 864	*	*
L. V. RR. Co.	162,498	1,491,508	133,442	1,432,674
D., L. & W. RR. Co.	98,711	1,250,109	111,666	1,331,767
D. & H. Canal Co.	66,196	987,621	94,402	980,309
Penna. RR.	53,906	693.336	62.660	759,788
Penna. Coal Co.	33,753	296,517	29,222	259,241
Total	676,227	7,292,697	652,787	7,012,690
Increase	23,440	580,007	....	.....
Decrease	....	....	....	.....

* Included in tonnage of Philadelphia and Reading R. R.

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

1882	5.550,077	1884	5,371,710
1883	6,396,368	1885	5,171,753

Production of Coke on line of Pennsylvania RR. for week ended March 26th, and year from January 1st:

Tons of 2000 pounds.

	1887. Week.	1887. Year.	1886. Week.	1886. Year.
Tyrone & Clearfield	35	1.735	.....	.....
Allegnany Region.	5,540	60,226	4,076	44,801
West Penn. RR.	2.884	27,728	2,326	22,016
Southwest Penn. RR	66,388	788,576	54,296	434,602
Penn. & W. Region	5,081	86,520	5,580	79,946
Monongahela	2,678	38,690	3,066	19,414
Pittsburg Region.	.....	.....	.....	.....
Snow-Shoe	845	12,152	147	9,211
Total	83,451	1,015,627	69,491	609,990

Production Bituminous Coal for week ended March 26th, and year from January 1st:
Tons of 2000 pounds, unless otherwise designated.

EASTERN AND NORTHERN SHIPMENTS.

	1887. Week.	1887. Year.	1886. Week.	1886. Year.
Phila. & Erie RR...	.....	.....	3,556	3,987
*Cumberland, Md..	53,336	578,554	‡	369,633
Barclay, Pa.....	3,174	58,345	3,576	48,914
*Broad Top, Pa.				
H. & Broad Top RR.	9,780	105,451	7,356	71,121
East Broad Top....	.....	.....	.....	.....
Clearfield Region, Pa.				
Snow Shoe.....	3,789	43,871	672	34,770
karthaus (Keating)	6,012	48,976	3,154	33,543
Tyrone & Clearfield	66,975	709,324	5,138	543,556
Alleghany Region, Pa.				
Gallitzin & Mountain....	11,206	210,336	11,295	150,647
Pocahontas Flat Top Coal.				
Norf'k & West. RR.	23,109	274,108	17,204	174,920
Kanawha Region. W. Va.				
Ches. & Ohio RR..	†30,000	349,831	25,000	293,236
Total.....	207,381	2,378,796	76,951	1,724,327

* Tons of 2240 lbs. †Estimated. ‡ Report not received.

WESTERN SHIPMENTS.

Pittsburg Region, Pa.				
West Penn RR.....	5,296	78,473	7,246	60,898
SouthwestPenn.RR.	3,734	39,797	5,624	1,506
Pennsylvania RR...	4,672	56,305	2,356	47,011
Westmoreland Region, Pa.				
Pennsylvania RR...	39,676	369,333	7,552	295,802
Monongahela Region, Pa.				
Pennsylvania RR...	9,054	84,588	9,337	49,052
Total.....	62,432	628,496	32,115	484,269
Grand total.....	269,813	3,007,292	109,066	2,208,696

Anthracite.

The general verdict is that the anthracite coal trade is dull. This is believed to be due more to dealers holding off in expectation of getting coal at lower prices than to a small consumption. The supplies, both in first and second hands, are thought to be small, and it is the opinion of those who have the best facilities of judging of the prospective demand, that the trade will take the 2,250,000 tons which it has been suggested is the proper quantity to be mined this month. There are no indications that prices will be reduced, especially by the principal shippers. In fact, all the evidence points to present prices being well maintained for the present, with prospects of higher prices later in the year. Coal is accumulating moderately, but this has not weakened prices. The certainty of higher railroad tolls has rather tended to stiffen the individual shippers, who have shown an indication to be weak in their prices.

The high prices that are being secured for coal, when considered in conjunction with the large production and small stocks, indicate that there is an enormous consumption going on, and should give the producers encouragement to maintain rates and make such curtailment of production as may be necessary to carry the trade through until July, by which time not only dealers but consumers will begin to provide for the wants of the fall and winter months. The famine of the past winter will cause many to make timely provisions for their wants, until, at least, they have forgotten their late experience.

The actual net prices for ordinary free burning coal f.o.b. vessels at present, as compared with those of the corresponding date last year, are as follows:

	1887.	1886.	Inc.
Lump.	$3 30@ 3.40	$3.00@ ..	$ .30@ .40
Steamboat....	3.30@ 3.40	3.00@.....	.30@ .40
Broken.	3.35@ 3.40	2.85@. ...	.45@ .55
Egg.	3.65 @.....	2.85@... .	.80@.....
Stove.....	3.90@ 4.00	3.25@.....	.65@ .75
Chestnut.....	3.85@.....	3.00@.....	.85@...
Pea....	3.00@.....	1.75@ 2 15	.85@ 1.25
Buckwheat...	2.00@ 2 50	1.50@ 1.75	.50@ .75
Dust..... .	1.50@ 1.60	1.15@ 1 25	.35@ ...

The production of anthracite coal from January 1st to March 26th was 7,292,697 tons, as compared with 7,012,690 tons for the corresponding period in 1886; 5,171,753 tons in 1885, and 5,371,710 tons in 1884. Although the tonnage from January 1st to March 25th last year was larger than for the same period in any of the previous two years, it was secured at the cost of complete demoralization to prices and a greatly overstocked market. The large movement of coal this year has been at high prices, without creating stocks, and still there is a very pressing demand for some sizes. There is food for thought here for both producers and consumers. The first should consider whether the prosperous condition of the country does not make it possible to demand and obtain good prices for coal, and the latter should weigh well the conditions to see whether it may not be wise to provide themselves liberally with coal at such prices as prevail, and not trust too much to the expectation of the lower prices which usually prevail between April 1st and the end of June, and sometimes even to the end of July.

It would be a very strange thing if a certain quantity of coal could not be obtained at concessions before an active trade once more sets in, but it is very doubtful if this quantity will be very large. The trade is approaching a critical period, and it is thought that it will require about three months' careful nursing. We think, however, that the gentlemen who advise the producers as to the conditions and requirements of the market will adopt a conservative policy, in which case we think prices will be maintained until such time as not even a suggestion will be necessary to make the trade very prosperous.

The announcement has been made through press dispatches that neither the Reading nor the Pennsylvania Railroad companies will become parties to a coal combination this year. We can add to this by saying that none of the other companies have the least idea of doing so either. Our opinion is, however, that the companies have a very simple and effectual substitute for a combination. If they will firmly stand by the current prices, and not unwisely stock coal or put it afloat, they will so regulate production that in time the necessities of dealers and consumers will become so great that the producers will have things entirely their own way.

The Delaware & Hudson Canal Company announces, under date of to-day, net prices f.o.b. at Rondout as follows:

Grate.....	$3.50	Chestnut.....	$4.00
Egg.....	3.65	Pea....	3.25
Stove	4.00		

The Philadelphia & Reading Coal and Iron Company announces the following f.o.b. prices for free-burning white ash coals:

	Port Richmond.	Elizabethport.
Broken.....	$3.40	$3.65
Egg.....	3.50	3.75
Stove....	3.90	4.15
Chestnut...	3.60	3.85
Pea.	2.50	2.75

Mr. John H. Jones, official accountant, furnishes the following statement of the anthracite coal tonnage for the month of February, 1887, compared with the same period last year. This statement includes the entire production of anthracite coal, excepting that consumed by employés, and for steam and heating purposes about the mines:

COMPANIES.	Feb., 1887.	Feb., 1886.	Difference.
Phila. & Reading RR. including Central R. R. of N. J.	854,669	755,726	Inc. 98,943
Lehigh Valley RR.....	480,616	480,736	Dec. 120
Del., Lack. & West. RR.	482,483	418,299	Inc. 64,184
Del. & Hud. Canal Co..	344,361	319,053	Inc. 25,308
Pennsylvania RR.....	225,106	267,076	Dec. 41,970
Pennsylvania Coal Co.	97,604	77,348	Inc. 20,256
N. Y., L. E. & W. RR...	66,165	66,789	Dec. 625
Total	2,551,003	2,385,028	Inc. 165,975

COMPANIES.	For year. 1887.	For year. 1886.	Difference.
Phila & Reading RR. including Central R. R. of N. J.	1,592,692	1,455,900	Inc. 136,793
Lehigh Valley RR.....	890,249	927,233	Dec. 36,984
Del., Lack. &West. RR.	832,719	915,059	Dec. 82,340
Del. & Hud. Canal Co.	700,002	632,139	Inc. 67,863
Pennsylvania RR	478,611	499,598	Dec. 20,987
Pennsylvania Coal Co..	176,837	160,934	Inc. 15,903
N. Y., L. E. & W. RR..	123,206	132,437	Dec. 9,231
Total.....	4,794,316	4,723,300	Inc. 71,016

Central RR. of N. J. tonnage for February, 1887, included in that of Philadelphia & Reading RR. 352,625 17 tons.

The stock of coal on hand at tide-water shipping points, February 28th, 1887, was 470,609 tons; on January 31st, 1887, 475,448 tons; decrease, 4,839 tons.

Bituminous.

There have been a few contracts consummated during the week under review at full pool prices, and cargo sales have been made upon the same basis. The higher prices tend to check the making of contracts, yet the outlook is very favorable and the producers are exceedingly firm in their views and quite sanguine of being able to carry out the pool programme. This is now signed by all but one shipper. It contemplates a business of 5,000,000 tons, at competitive points, this year. The percentages to the several regions are as follows:

Clearfield...	32¼
Cumberland	28¼
Norfolk & Western and Chesapeake & Ohio....	21
Beech Creek...	10½
Reynoldsville.....	3
Elk Garden	5
	100

The division of the 21 per cent between the Norfolk & Western and the Chesapeake & Ohio roads has been left to arbitration. The various regions will settle among themselves the division of the allotments made. The agreement provides a penalty for overproduction which shall be divided among those who do not exceed their allotment. The commission to be allowed to middle-men is 10 cents per ton.

Although the shipments of bituminous coal so far this year are largely in excess of those to the corresponding date of last year, this coal is not in liberal supply and prices are very much better than a year ago. Under the revised tolls for anthracite coal, it is very doubtful if the smaller sizes will be sent to market this year in any great quantities. This should greatly increase the field for bituminous coal.

Vessels at Baltimore are not yet in full supply. The rates to Boston are $1.25; to Sound ports, $1.15; and to New York, $1.10. From Philadelphia to Boston the rate is $1.10; to Sound ports, $1; and to New York 90 cents. The new tolls on bituminous coal have not been announced, although momentarily expected.

Seaboard and Steam Coal Association.

TERMS AND CONDITIONS OF SALE.

Terms of payment cash, thirty days from date of bill of lading or date of invoice, for each cargo or shipment.

All coal must be taken by the purchaser regularly, and in substantially full monthly proportions, and when delivered on board vessels, boats or barges at the points of shipment, is to be in all respects at purchaser's risk. Bill of lading or other testimony of shipment to be proof of delivery both as to time and quantity.

Captains of vessels sent by purchasers for their coal must bring written orders, and each take his regular turn in loading. All possible dispatch will be given in loading, but no claims allowed for demurrage.

When coal that has been ordered is not sent for or directed to be shipped within the time contracted for, the shipper shall have the option of shipping it at current rates of freight, or canceling such portions of the order as may not have been filled; and where the contract is for coal to be shipped by canal the shipper is to have the option of canceling the contract upon the close of canal navigation for the year to which such contract shall apply.

The shipper will use every exertion to procure vessels and will effect insurance when desired to do so by the purchaser, but will not, in either case, assume any responsibility in the matter.

Every effort will be made for the prompt and faithful fulfillment of contracts, but the seller will not be responsible for the delivery of the same if prevented by strikes or combinations of miners, laborers or boatmen, accidents in the mines, or interruption of transportation or navigation from any cause or any occurrence beyond his control. In such cases the obligation to deliver coal under such contracts is thereby cancelled to an extent corresponding to the duration of such interruption, and no liability shall be incurred by the seller for damages resulting therefrom.

Boston. March 31.

[From our Special Correspondent.]

The market for anthracite coal is not in as good condition as when I last wrote. Dealers at retail are holding off, and there is no expectation of any large demand from them at present. F.o.b. prices remain nominally unchanged, but are barely maintained, the inclination being to further weakness. Sales of Stove coal are chiefly at $4 f.o.b., the range running down to $3.85 for hard Stove. Other sizes are unchanged, pea and buckwheat still being in very small supply.

Pocket dealers have come out with new prices, but as trade is dull and dealers in the interior are selling coal bought at high prices, the very substantial reduction is not of much present moment to the trade. New prices are: Stove, $5.50; Egg, $5; Broken, $4.85. This is a reduction of 75 cents per ton on Stove, 85 cents on Egg, and $1 on Broken.

The interest of the week has centred entirely in the doings of the other side of the house, namely, in the announcement of f.o.b. prices for the season on bituminous coal. The pool, unfortunately, were inveigled into making prices instead of a price. The supposed brilliant idea of $2.50 f.o.b. at all ports for railway contracts and $2.65 for other business is considered brilliantly bad by most every one in this market, and rash talk about the immediate disruption of the pool has been abundant. The trade has indeed been badly set off its feet by these prices, but,

of course, will sober down shortly. To show the absurdity of the plan, it need only be noted that several of our New England manufacturing concerns buy more than at least one of our railroads, and they will not pay ten cents more very readily. To add to the excitement, the Fitchburg Railroad closed its contract for 75,000 tons the very day prices were announced. Every body agreed with every body else that it was not business for a railroad to buy coal at full figures on the first day without waiting to see if prices would hold, particularly when there was so much talk of breaking the pool. As all further agreed that the Fitchburg coal buyer was a business man, it was the conclusion that something crooked had been done. The contract was reported as taken by John C. Scott & Sons, the Philadelphia Clearfield operators. Further rumors are circulated that delivered prices or their equivalent are being quoted. As there seems to be no likelihood of prices going higher, buyers will be apt to wait until the pot stops boiling.

The Vessel Owners Association is likely to have its backbone severely tested this season. Rates are already weak at minimum, and barges are said to be running from New York at $1 flat.

We quote, exclusive of discharging: New York, 85@95c.; Philadelphia, $1.05; Baltimore, $1.25@$1.35; Newport News and Norfolk, $1.05@$1.10.

Retail movement is slack. We quote delivered prices as follows: White Ash Stove, $6@$6.25; Egg, $5.75@$6; Broken, $5.50@$5.75; Lorberry, $7; Franklin, $7.50@$7.75 -all above are delivered prices.

Wharf prices have also been reduced as follows: Broken, $4@$4 25; Egg, $4.50@$4.75; Stove, $4.75@$5.

Buffalo. March 31.

[From our Special Correspondent.]

"There is nothing to say about coal matters and freight rates just at present," says a dealer and shipper. "You know as much as I do about the present and future of the coal trade," says another. "Solve the riddle of the Inter-State Commerce Bill, and then you will have matter enough to fill up with, without the necessity of putting conundrums to us." A third declared that "the trade can do nothing but await developments, and you had better take a rest and not bother yourself and us with your appeals for news; it is a wonder, anyway, how you manage to spin a weekly [query, was he sarcastic and meant WEAKLY] yarn, when your materials are so scanty."

The following "marine" item appeared in a local newspaper on Monday last: "Several vessels managed by Captain Wilson will load coal to relieve the Pennsylvania trestle. The captain, it is reported, has taken a lot for Lake Superior at 75c. for hard and 82½c. for soft." No opening rate to Lake Michigan ports has been fixed here yet; vessel men talk from 75c.@$1.

Manager Bullard, of the Union Steamboat Line, received the following dispatch yesterday from Mackanac City: "Weather very cold; ice stronger, if any thing. Mercury at zero."

The weather during the past week in this neighborhood and all Lake Erie points has been severely cold and wintry. Fields of new ice have formed within a mile of our harbor over a foot thick. The prospects of an early opening of navigation here have been dispelled, and prognosticators have hid themselves behind stoves and declined to converse on the subject, as it is one of those which, under present circumstances, they are aware that the least said the better they will maintain their reputation for possessing acute and profound perceptive faculties.

Navigation opened Monday from Detroit to Cleveland; the only ice encountered was directly off the latter port.

There is a pneumatic machine in Cleveland called the Cyclone barge elevator, which, if proved to be a success, may revolutionize the present method of elevating coal from vessels. It handles coal as easily as it does grain, and the owner claims ability to transfer from vessels to canal boats or receiving houses from 25,000 to 50,000 bushels of grain per hour. I have seen this "cyclone," and am of the opinion that if it can be brought into use great results may be expected to accrue from its use.

No decision has as yet been arrived at regarding the question of reducing or abolishing tolls on the Welland canal this season. The Canadian Minister of Railways, Mr. Pope, is having a special report prepared on the subject; the decision of the cabinet will be based thereon, without doubt.

Pittsburg. March 31.

[From our Special Correspondent.]

Coal.—The Ohio River is still too low for coal shipping purposes. The lower markets, however, are well supplied, with low prices prevailing at all points. Mining in the Ohio and Youghiogheny valleys is going on briskly; a large number of coal boats and barges are loaded, ready to take advantage of the first rise. The shipments from January to April 1st show a material falling off as compared with last season.

The current rates for coal at the tipples, based on present mining rates, are: First pool, per 100 bushels, $4.50; second pool, $4.25 per 100 bushels; third pool, $3.62½, and fourth pool, $3; Railroad, $4.50@$5 per 100 bushels.

Connellsville Coke.—Steady, with reasonable activity. Prices for April are expected to show no change. The recent dispute between the men and their employers will be settled by arbitration. The rates are as follows: Blast-furnace, $2 f.o.b. cars at ovens; foundry, $2.30; crushed, $2.60.

Freights westward are as follows: From the ovens to Pittsburg, 88 cents a ton; to the Mahoning and Shenango valleys and Wheeling, $1.65; and to Chicago, $3.30.

FREIGHTS.

The latest actual charters to April 1st, per ton of 2240 pounds:

To	From Philadelphia	From Baltimore.	From New York shipping ports.
Annapolis	.75	.....	.....
Baltimore	.60§	..	.....
Bangor	.....	1.25	.....
Bath, Me.	.....	1.25	.85*
Boston, Mass	1.05	1.25	.85*
Bridgeport, Conn.	.....	1.15	.70
Bristol	.....	1.25	.75@.80
Brooklyn	.....	1.10	.....
Cambridge, Mass.	.....	.....	85* 3c.
Cambridgeport	.....	.....	85* 3c.
Charleston, S. C.	.....	.80@.90	.....
Charlestown	.....	.....	.85*
Chelsea	1.05*	.....	.85*
Com. Pt., Mass.	.....	.....	.85
E. Boston	.....	.....	.85*
East Cambridge	.....	.....	85* 3c.
E. Gr'nwich, R. I.	.....	.....	.80
Fall River	.....	1.15	.75@.80
Galveston	.....	3.25	.....
Gloucester	1.15*	.....	.....
Lynn	1 20*	.....	.....
New Bedford	1.05*	1.15	.....
Newburyport	1.05*	.....	1.00*
New Haven	.....	1.15	.70
New London	.....	1.15	.75
Newport	.....	..	.75@.80
New York	.90	1.00	.25§
Norfolk, Va.	.50	.....	.....
Norwich	.....	.....	.75@.80
Norwalk, Conn.	.....	.....	.70
Portland, Me.	.....	1.25	.85*
Portsmouth, N.H.	.....	1.35	.95*
Providence, R. I.	.....	1.15	...
Richmond, Va.	.....	.....	.....
Roxbury, Mass.	.....	.....	.....
Salem, Mass.	1.05*	1.25	.83*
Savannah	.....	1.00	.....
Somerset	.....	1.15	.....
Wareham	.....	1.45	.....
Washington	.85	.....	.....
Williamsb'g, N.Y.	.....	1.10	.....
Wilmington, N.C.	.....	1.00	.....

* And discharging. † And discharging and towing. 3c. per bridge extra. § Alongside. ‖ And towing up and down. ¶ And towing. †† Pilotage. ** Below bridge. *** Old B. L.

MARKETS.

NEW YORK, Friday Evening, April 1.

Prices of Silver per ounce troy.

Mar	Sterling exchange	Lond'n Pence.	N. Y Cents	Mar Apl	Sterling exchange	Lond'n Pence.	N. Y. Cents
26	4.87½	44⅞	97¾	30	4.86½	44 5-16	96
28	4.87	*	‡	31	4.86½	44⅛	95½
29	4.86½	†	§	1	4.86½	44	95¼

* 44⅞ nominal. †44⅛ dull. ‡ 47½ nominal. § 97a., 96 bid, nominal.

The unsettled condition of the Eastern Exchanges has been met by a drooping silver market, possibly the somewhat emphatic opinions expressed in Germany concerning the double standard and the probable course of the English Currency Commission have contributed to this unfortunate decline in the price of the metal.

Foreign Bank Statements.—The governors of the Bank of England, at their weekly meeting, made no change in the minimum rate of discount, and it remains at 3 per cent. During the week, the bank gained £75,000 bullion, and the proportion of its reserve to its liabilities was reduced from 49·55 to 48·57 per cent, against 39¾ per cent at the same time last year. On the 31st ult., the bank gained on balance £30,000 bullion. The weekly statement of the Bank of France shows a loss of 2,975,000 francs gold, and 650,000 francs silver.

The Metal Exchange.

Copper.—The market is dull and unsatisfactory as to prices, and strong statistically. We quote Lake copper at 10½@10¾ cents, Orford & Baltimore 9¼@9¾ cents; 25,000 lbs. of Spot Lake were sold on the Metal Exchange to-day at 10·35 cents, which is believed to be the very bottom of the market, and probably the "turning point," though we do not see any appearance of any immediate advance.

Chili Bars are quoted to-day by cable to the Metal Exchange at £39 12s. 6d., and Best Select, £44 10s., which is about the rate of a week ago. It is rumored that the English stock of Chili Bars declined during the month of March about 2500 tons. Yet in the face of this and of the certainty that but comparatively little copper will go from this country this year; the collapse of the Boleo, lessening output from Chili, and no great new sources of supply coming forward, the price of copper remains very low.

The latest rumor about Anaconda is that the company has engaged freights for 250 tons of matte a month, with the privilege of increasing it to 300 tons. This is somewhat of a come down from the rumored but imaginary 8000-ton sale mentioned some weeks ago. The Old Dominion mine is reported to have opened a large body of ore.

The exports of copper during the week wer 1250 pounds, value $130, by steamship Gellert to Hamburg; 77,607 pounds (437 bars) by City of Berlin to Liverpool.

The export of copper matte reported by us last week was, in part, a "line clearance" (that is, a through shipment from the West), by steamship England, of 754,900 pounds (3769 bags), value $37,690.

Tin.—The market has been very dull and somewhat weaker during the past week, although there has been a little recovery in the last two days. To-day's prices at the Metal Exchange are: Spot, 22·50c.; prompt delivery, 22·65c.; June, 22·70c.; which are from 0·05c. to 0·10c. higher than those of Wednesday. The cables from London quote for Spot, £102 and three months, £102 7s. 6d. The consumption continues large, and there are reports of considerable shipments from the Straits. Our spot stocks here are large, probably 2000 tons, or say a three months' supply.

Lead.—With the exception of a few car-loads sold at 4⅜@4·35c. no business has been reported here during the week, 4·30c. is offered and 4⅜c. asked, though some Western smelters hold a little higher. The business is extremely dull, with the smelters firm on the one side and manufacturers equally obstinate on the other. Sheet lead is quoted 7¾c.; Lead Pipe, 7c. less the usual 20 per cent discount. Sheet is $1.40 per 25 lb. bag. White lead is quoted at 5½c., with much competition in the market.

Messrs. John Wahl & Co., of St. Louis, telegraph as follows to-day: The market has ruled with scarcely any fresh business since our last report. Sales for the week sum up to perhaps 600 tons, at prices ranging from 4·15@4·20c.

Messrs. Everett & Post, of Chicago, telegraph as follows to-day: There is a somewhat better feeling, due to growing inquiry. There is a general disposition to buy, especially futures. Sales for the week sum up over 1000 tons, Western buyers, at 4·20c., but principally 4·22½@4·25c.

Spelter.—This metal continues its sluggish course, and may be quoted at 4·45@4·55c. for common Domestic, and Silesian 4¾@4⅞.

Zinc oxide is quoted 4@4½c., according to quality, for domestic; 5⅝c. for Belgian; and 7½c. for Paris green seal in barrels.

Antimony.—There is no change in this metal. We quote Hallett's at 7⅛@7⅝c., and Cookson's 9c. Cables to the Metal Exchange quote Hallett's £29 10s., which is a decline of 20s. during the week.

Quicksilver.—There is no change to report. We quote $42 per flask, and 52½@53c. per pound; in London, £7 per flask.

Nickel.—We quote 65@67½c. per pound.

Aluminium—Is quoted at 90c.@$1 an ounce.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, April 1.

The present condition of the iron market hardly varies from that reported a week ago. Although there has been very little new business, the furnaces and mills continue very busy delivering material which has been ordered ahead. There is almost no change to note in prices. In certain directions there has been a holding off on the part of buyers, nominally to await the adjustment of freights under the Inter-State Commerce bill but as the time approaches for the meeting of the Commissioners the impression gains ground that any new regulations that may be made will interfere little or not at all with the usual course of trade and rates of freight. In fact, there have been instances in which parties have been trying to rush deliveries at freight rates heretofore prevalent, in anticipation of advanced rates, when it has been actually found that even lower rates could be obtained, so little fear was there of disturbing changes. A concise summary of the present condition of the iron market is: New materials are quiet and very firm; old materials are dull and weak for prompt delivery, dull and strong for future delivery.

The basis for the firmness in new materials is the condition of the great staple, pig-iron. The furnaces have sold ahead; are very busy with deliveries; are not seeking new orders, and it is very hard to buy any good pig-iron for prompt delivery. The consumption of pig-iron is enormous. Take a single instance, the pipe foundries. Four of these are now making 160,000 tons of pipes annually, and have inquiries ahead. The market for iron pipes is stiff, and prices have an advancing tendency. There has been a decided check to the importation of Scotch irons, which continue dull and weak. Present importations will not exceed 1000 tons per week.

Steel rails, too, continue firm, and there is a decided impression in some quarters that the summer will see higher prices and increased importations, as it is uncertain how much the American mills can take beyond their 1,500,000 tons sold for this year. The inquiries during the past week have increased, some for 10,000 tons lots, and even larger. One sale is reported of 2000 tons at about $39 at mill.

The large consumption of pig-iron and steel rails of course carries with it a demand for bar iron, track fastenings, etc.

The makers of structural iron have plenty of work ahead in bridges and elevated roads. The Brooklyn road contracts are practically closed, the larger amount going to the New Jersey Steel and Iron Co. The bids for this work varied from $3.95 @ $4.20.

Old rails have been the mountebank of the market, as they are apt to be. As an instance of the queer freaks in this material, it is stated that out of a lot sold several weeks ago to a Western mill, a considerable portion has come back to the original seller, after several changings of hands at a price more than $3 per ton under the first selling price. Still, the impression is strong among large dealers in old rails that the mills must have them later, and there have been none but "forced" sales at the lowest figures.

The Standard quotations are as follows:

American Pig Iron.—No. 1 X, $21@$22; No. 2 X, $20@$21; Forge, $18.50@$19.50.

Scotch Pig-Iron.—Coltness, $22.50@$23; Dalmellington $20.50@$21; Clyde, $20.50@$21; Summerlee, $22@$22.25; Eglinton, $20@$20.50.

By cable to the Metal Exchange to-day: Coltness, 55s. 6d.; Langloan, 51s.; Summerlee, 53s.; Gartsherrie, 48s. 6d.; Glengarnock, 48s. 6d.; Dalmelling ton, 46s.; Eglinton, 44s. 6d.

Bessemer Pig.—Foreign, $20.50@$20.75; Domestic, $20@$20.50.

Spiegeleisen.—Foreign 20 per cent, $27@$27.75.

Steel Blooms.—$30@$30.50.

Steel Billets.—$32@$33.

Steel Nail Slabs.—$32@$32.50.

Charcoal Blooms.—$54@$56.

Scrap Blooms.—$36@$37.

Steel Rails.—Heavy section, $39@$40 at mill. Light sections, $44@$44.50 at mill.

Structural Iron and Steel.—At mill: Bridge Plate, 2·35@2·45c.; Angles, 2·3@2·4c.; Tees, 2·7@2·8c.; Steel Angles, 2·6@2·75c. From dock, Beams and Channels, 3·3c., base.

Steel Plates.—On wharf: Tank and Ship, 2·9@3·1c.; Boiler Shell, 3¼@3½c.; Boiler Flange, 3½@3¾c.; Boiler Fire-Box, 4@4½c.

Merchant Steel.—American Tool Steel, 7½@10c.; special grades 10@20c.; Crucible Machinery Steel, 4@4½c.; Bessemer Machinery and Spring, 2·7@3c.; Sleigh Shoe Steel, 2·4c.; Bessemer Cutlery, 3·2c.

Plate Iron.—Common Tank, 2·45@2·55c.; Refined, 2·5@2·6c.; Boiler Shell, 2·7@2·8c.; Boiler Flange, 3·7@3·8c.; Extra Flange, 4¼@4½c.

Bar Iron.—For Refined, 2·1@2·2c., base at mill; Common, 2@2·1c., base at mill.

Cast-Iron Pipe.—$32@$38, according to size.

Rail Fastenings.—Spikes, 2·60@2·75c., delivered; Angle Fish-Bars, 2¼c.; Bolts and Square Nuts, 3·1@3·2c.; Bolts and Hexagonal Nuts, 3·3@3·4c.

Scrap Iron.—Foreign, ex ship, at $22.50@$23; Choice No. 1, ex yard, at $23.50@$24.50.

Old Rails.—Tees at $22@23.; Double-Heads, at $22.50@$23.50.

Louisville. March 30.

[Reported by GEORGE H. HULL & Co.]

Aside from the numerous inquiries for small lots of softeners, the market has been quiet the past week. We anticipate no improvement in the demand until after the effect of the Inter-State Commerce bill has developed itself. Buyers are determined to hold their orders until then. We report a good demand for old car wheels, and in consequence of their scarcity we anticipate a free purchase of the high grades of wheel irons.

We give our quotations:

PIG-IRON.

Southern Coke, No. 1 Foundry	$21.50@$22.00
" " No. 2 "	20.50@ 21.00
" " No. 2½ "	20.00@ 20 50
Hanging Rock Coke. No. 1 Foundry	21.00@ 21.50
Southern Charcoal, No. 1 Foundry	22.00@ 23 00
Silver Gray, different grades	20.00@ 20.50
Southern Coke, No. 1 Mill, Neutral	19.50@ 20.00
" " No. 2 " "	19.50@ 20.00
" " No. 1 Mill, Cold Short	19.00@ 19.50
" Charcoal, No. 1 Mill	20.50@ 21.00
White and Mottled, different grades	17 50@ 18.50
Southern Car-Wheel, Standard Brands	26.00@ 27.00
" " Other "	24.00@ 25.00
Hanging Rock, Cold-Blast	27.00@ 28 00
" " Warm-Blast	23.00@ 24 00

Philadelphia. April 1.

[From our Special Correspondent.]

The iron trade manifests signs of fresh activity in consequence of the fixing of freight schedules. Yesterday and to-day quite a number of new buyers were heard from in person or by mail concerning new requirements for the next three months. Buyers are far from being under any immediate necessity for purchasing, but after all there is a feeling that forward requirements for all kinds of crude and finished material had better be covered if contracts can be made at fair rates. Furnace companies are expecting a heavy increase of orders, and are willing to name the easiest prices that higher cost of production will allow. Coal, coke, labor and freight, all have been changed in cost. Some managers say their margins are scarcely any better than when iron was $2 per ton lower. From nearly every interior point where iron and steel are made, we have rather glowing reports of heavy consumption, moderate stocks, steady demand, and so on. The agents who represent importers have not succeeded in doing much new business, and buyers are well off as yet. Rail blooms were quoted this week to inquirers after foreign material. There is room for a large business as soon as buyers get ready. Ore receipts continue heavy; one lot of fourteen hundred-pieces old rails arrived. Muck bars are in demand, about equal to roll capacity. Anthracite blooms are held up. Bessemer pig is quiet, for foreign. Merchant iron continues in fair demand, though shadings are known of. Nail makers deny that concessions have been made, but do not report large transactions. Sheet-iron quotations hold up well, except for galvanized, which would be weaker if buyers cared to sieze an opportunity. Plate and tank is quoted at full prices; but as scarcely any heavy business has been done, it is not safe to say prices are firm. Structural iron quotations are firm, and enough business is hanging around to keep mills full. Steel rail orders were placed this week in western mills, and rail makers say that April's business will fall very little under 100,000 tons. Tees are $23@$23.50, nominally. Scrap is accumulating at yards.

Pittsburg. March 31.

[From our Special Correspondent.]

A combination of circumstances has produced a quiet market. There has been a large falling off in the demand for raw iron, buyers still holding off waiting for prices that will meet their views. Confidence among certain holders is still strong, however, and there is reason to believe it is based upon good and sufficient foundations. On the other hand, there are others that seem equally confident that lower prices will prevail in the near future. The weight of opinion favors the idea of a demand sufficient to maintain present rates. As regards the week closed, it can not be called very satisfactory from a seller's point of view. Sales were very much restricted, and prices in some instances shaded, sometimes a mere fraction; in other cases, cuts were of a more decided character. Still, the offerings are not large, and should the buying fever set in again good iron will seem to be scarce. The position is, therefore, more complicated than ordinary, and until there is something really tangible both buyers and sellers may be expected to show continued hesitancy and timidity.

Of Southern iron, there are scarcely any offerings here. "Cold Short" hit the nail on the head when he wrote this: "When Birmingham, Ala., workmen have become civilized men they will not work there any more for from 60c. to $1 per day. Like all ballooning, too much gas will burst the bag some day. In the meantime, men are seduced from profitable, active, and permanent business occupations and employment by false claims and misrepresentations, and harm done. Why not rather have stable, substantial progress, based on tangible, realistic advantages? If slow, they are sure. Nevertheless, there is as much probability of Alabama's eclipsing the fame and prosperity of the upper Ohio Valley as there is of the Mississippi and Ohio rivers interchanging currents." Muck bar is without change; old rails are weaker, and offered at a decline, with large receipts of imported. The 1st of April being moving day here, many are moving both dwelling and office. Until that is accomplished, business will be a secondary consideration.

Coke or bituminous:	$	$
Foundry No 1	21.25@	21.75
Foundry No. 2	20.50@	21.00
Gray F., No. 3	20.00@	20.50
" " No. 4	19.25@	19.50
White	18.25@	18.50
Mottled	18.75@	19.25
Silvery	19.00@	20.00
Bessemer	22.50@	23.00
Charcoal:		
Foundry No. 1	24.00@	25.00
Foundry No. 2	23.00@	24.00
Cold-Blast	27.00@	30.00
Warm-Blast	24.00@	25.00
20 p. c. Spiegel	@	31.00

	$	$
Muck-Bar	34.00@	35 00
Steel Blooms	34.50@	36.00
Steel Slabs	33.00@	35.00
Steel Crop Ends	24.50@	25.00
St'l Bl'm Ends	24.00@	24.50
Old Iron Rails	26.00@	27.00
Old Steel Rails	24.00@	25.00
No. 1 W. Scrap	25.00@	26.00
No. 2 W. Scrap	23.00@	24.00
Steel Rails	41.00@	41.50
" light sect's	40.00@	45.00
Bar Iron	2.00@	
Nails $2.60 net car lots.		
Steel Nails $2.60 net car lots.		

SALES SINCE LAST REPORT.

1000 Tons Bessemer, spot	$23 00 cash.
500 Tons Gray Forge, Lake Ore	20.25 cash.
1000 Tons Bessemer, April	23.10 cash.
500 Tons Gray Forge, Wheeling delivery	21 25 cash.
500 Tons Gray Forge, Lake Ore	20.25 cash.
100 Tons Gray Forge, Lake Ore	19.50 cash.
50 Tons Silvery Foundry, Native Ore	20 00 cash.
50 Tons Charcoal, No. 1 Foundry	25.50 cash.
25 Tons Charcoal, Cold Blast	28.00 cash.
1000 Tons Muck Bars, April and May, neutral	35.75 cash.
500 Tons " April, neutral	35.50 cash.
200 Tons " spot	34.00 cash.
300 Tons Steel Billets, spot	35.50 cash.
500 Tons Steel Wire Rods, Amer., at Works	44.00 cash.
600 Tons Old Rails, Imported T's, all rail	26.30 cash.
500 Tons Old Rails, D. H., all rail	27.30 cash.

FINANCIAL.

Mining Stocks.

NEW YORK, Friday Evening, April 1.

El Cristo in a "Bear Garden."

Details of the break in El Cristo shares which took place on the afternoon of the 25th ult. were received too late for publication in our last week's issue. Notwithstanding the lapse of a week, we believe that the facts connected with the great bear movement in that stock will prove "mighty interesting reading," even at this comparatively late day. El Cristo had been the most active of all shares dealt in on the Mining Exchange up to the day now known as El Cristo's Black Friday. More of that stock had been traded in since Christmas, a greater advance had taken place in it, the general mining market had in consequence of its presence showed a greater degree of improvement, and the brokers generally were profiting by the multiplicity of orders from customers to a greater degree than seen for months, when the crash fell upon the mining board, and the entire market has since dragged along in a very unsatisfactory manner. It lacked but thirty minutes before the close of business on the 25th ult. when the smash set in. Harpending, who had successfully engineered the deal from $2 up to $9.50, was in the crowd as usual at 2:30 P.M., bidding $9⅝ for any part of 5000 shares. No one appeared anxious to sell stock at this price. The general impression was that $15 at least would be reached before many days. The crowd suddenly grew

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied to date.	Assessments. Date and amount per share of last.	Dividends. Total paid to date.	Dividends. Date and amount per share of last.
1	Adams, s. L.	Colo.	$1,500,000	150,000	$10	*	.....	$555,000	Jan. 1887 .15
2	Alice, s. c.	Mont	10,000,000	400,000	25	*	.....	750,000	Sept 1886 .06¼
3	Amie Con., s. L.	Colo.	5,000,000	500,000	10	*	.....	330,000	Oct. 1883 .05
4	Amy & Silversmith, s.	Mon.	.....	341,419	.....	.....	.....	264,852	Dec. 1886 .10
5	Atlantic, c.	Mich	1,000,000	40,000	25	$280,000	Apl. 1875	$1.00	360,000	Jan. 1887	$1.00
6	Argenta, s	Nev..	10,000,000	100,000	100	295,000	July 1885	.10	40,000	Feb. 1880	.20
7	Aurora, L.	Mich	1,000,000	40,000	25	.....	.....	.....	40,000	Apl. 1887	1.00
8	Barbee & Walker, s.	Utah	1,000,000	100,000	10	*	.....	.....	60,000	Nov 1880	.10
9	Bassick, G. S.	Colo.	10,000,000	100,000	100	*	.....	.....	400,000	Mar. 1884	1.00
10	Belle Isle, s.	Nev..	10,000,000	100,000	100	100,000	Feb 1887	.20	300,000	Dec. 1879	.25
11	Belcher, G. S.	Nev..	10,400,000	104,000	100	2,217,335	Dec. 1885	.30	15,397,000	Apl. 1876	1.00
12	Bellevue Idaho, S. L.	Idah.	1,250,000	125,000	10	26,250	Dec. 1883	10	200,000	Jan 1887	.10
13	Big B'nd Hydraulic, G	Dak..	1,000,000	200,000	5	*	.....	.....	223,000	Mar. 1887	.03
14	Black Bear, G.	Cal..	3,000,000	30,000	100	22,500	Dec. 1884	.25	895,000	May 1883	.20
15	Bodie Con., G. S.	Cal..	10,000,000	100,000	100	374,990	Jan. 1887	.50	1,602,572	Apl. 1885	.50
16	Bonanza Developm't	C & M	3,000,000	300,000	10	.....	.....	.....	135,000	Oct. 1882	.15
17	Bonanza K'g, Cons. s.	Cal..	1,000,000	100,000	10	*	.....	.....	185,000	Feb. 1885	.10
18	Boston & Mont, G.	Mont	2,500,000	250,000	10	*	.....	.....	520,000	Jun 1886	.15
19	Breece, s.	Colo.	5,000,000	200,000	25	*	.....	.....	2,000	Feb. 1880	.01
20	Brooklyn Lead, L. s	Utah	500,000	50,000	10	.....	.....	.....	102,000	Sept 1886	.05
21	Bulwer, G.	Cal	10,000,000	100,000	10	40,000	Oct. 1885	.20	175,000	Jan. 1884	.10
22	Caledonia, G.	Dak	10,000,000	100,000	100	505,000	May 1885	.15	40,000	Feb. 1886	.10
23	Calumet & Hecla, C.	Mich	2,500,000	100,000	25	1,200,000	.....	.....	28,850,000	Mar. 1887	5.00
24	Carbonate Hill, s. L.	Colo.	2,000,000	200,000	10	*	.....	.....	80,000	Apl. 1884	.05
25	Caribou Con., s.	Colo.	1,500,000	150,000	10	*	.....	.....	50,000	Mch 1880	.10
26	Castle Creek, G.	Idah.	100,000	100,000	1	.....	.....	.....	51,000	Oct.. 1883	.03
27	Cataipa, s. L.	Colo.	3,000,000	300,000	10	*	.....	.....	270,000	May. 1884	.10
28	Central, C.	Mich	500,000	20,000	25	100,000	Sept 1861	.06	1,820,000	Feb. 1887	2.00
29	Christy, s.	Utah	10,000,000	100,000	100	.....	.....	.....	10,000	Jun. 1885	.10
30	Chrysolite, s. L.	Colo.	10,000,000	200,000	50	*	.....	.....	1,680,000	Dec. 1884	.25
31	Colorado Central, s. L	Colo.	2,750,000	275,000	10	*	.....	.....	198,750	Apl. 1887	.05
32	Cons. Cal. & Va., G. S	Nev..	21,600,000	216,000	100	108,000	Jan. 1885	.20	388,000	Mar 1887	.50
33	Con. Gold Mining, G.	Ga...	500,000	100,000	5	*	.....	.....	108,000	Nov. 1883	.02
34	Contention, s	Ariz.	12,500,000	250,000	50	.....	.....	.....	2,587,000	Dec. 1884	.25
35	Crescent, s. L. G.	Utah	15,000,000	600,000	25	±	.....	.....	210,000	Aug. 1886	.05
36	Crown Point, G. S.	Nev..	10,000,000	100,000	100	2,675,000	Feb. 1882	.25	11,588,000	Jan. 1875	2.00
37	Daly, s. L.	Utah	.....	150,000	.....	.....	.....	.....	75,000	Feb. 1887	.50
38	Deadwood-Terra, G.	Dak..	5,000,000	200,000	25	*	.....	.....	$900,000	Jan. 1883	.10
39	Derbec B. Grav., G. S.	Cal..	10,000,000	100,000	100	90,000	Dec. 1881	.10	140,000	Jun. 1886	.10
40	Dunkin, s. L.	Colo.	5,000,000	200,000	25	*	.....	.....	220,000	Sept 1884	.05
41	Elkhorn, G. S.	Mont	1,000,000	100,000	10	50,000	July 1883	.50	165,000	Mar. 1887	.05
42	Eureka Con., G. S. L.	Nev..	5,000,000	50,000	100	500,000	July 1886	1.00	4,817,500	July 1882	.25
43	Evening Star, s. L.	Colo.	500,000	30,000	10	*	.....	.....	1,400,000	Nov 1883	.50
44	Excelsior, G.	Cal..	10,000,000	100,000	100	560,000	Sept 1885	1.00	875,000	Oct. 1880	.25
45	Father de Smet, G.	Dak..	10,000,000	100,000	100	200,000	Nov 1878	1.00	1,125,000	Oct. 1885	.20
46	Franklin, C.	Mich	1,000,000	40,000	25	220,000	Jun. 1871	.....	550,000	Dec. 1886	1.00
47	Freeland, G. S. C.	Colo.	5,000,000	200,000	25	*	.....	.....	190,000	July 1886	.10
48	Fresno Enterprise, G	Cal..	5,000,000	100,000	50	.....	Mch 1883	.10	110,000	July 1882	.10
49	Garfield Lt., G. S	Nev.	500,000	100,000	5	.....	.....	.....	12,000	Dec. 1883	.12
50	Gould & Curry, G. S.	Nev..	10,800,000	108,000	100	4,100,000	Mar. 1887	.50	3,826,000	Oct. 1870	10.00
51	Grand Central, s.	Ariz.	1,000,000	100,000	10	.....	.....	.....	625,000	Dec. 1882	.25
52	Grand Prize, s.	Nev..	10,000,000	100,000	100	570,000	Apl. 1886	.50	495,000	Mar. 1884	.25
53	Granite, s.	Colo.	125,000	125,000	1	.....	.....	.....	6,250	May 1883	.01
54	Granite Mountain, s.	Mont	10,000,000	400,000	25	.....	.....	.....	2,100,000	Apl. 1887	.50
55	Green Mountain, G.	Cal..	1,250,000	125,000	10	*	.....	.....	212,000	Nov. 1881	.07½
56	Hale & Norcross, G. S	Nev..	11,200,000	112,000	100	5,030,800	Mar. 1887	.50	1,598,000	Apl. 1871	5.00
57	Hall-Anderson, G.	N. S..	150,000	150,000	1	.....	.....	.....	7,000	Jan. 1882	.05
58	Hecla Con., s. G. L. C.	Mont	1,500,000	30,000	50	*	.....	.....	1,122,000	Jan. 1887	.50
59	Hel'a Mg & Red, G. S. L	Mont	3,315,000	663,000	5	*	.....	.....	197,970	July 1886	.06
60	Holmes, s.	Nev..	10,000,000	100,000	100	300,000	Sept 1885	10	75,000	Apl. 1886	.25
61	Holyoke, G.	Idah.	200,000	200,000	1	.....	.....	.....	27,000	Feb. 1883	.10
62	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	Jnly 1878	1.00	3,768,750	Mar. 1887	.20
63	Honorine, s. L.	Utah	500,000	250,000	2	25,000	Jun. 1883	.....	87,500	Dec. 1886	.05
64	Hope, s.	Mont	400,000	8,000	50	*	.....	.....	158,252	Oct.. 1884	1.50
65	Horn-Silver, s. L.	Utah	10,000,000	400,000	25	*	.....	.....	4,000,000	Nov. 1884	.50
66	Idaho, G.	Cal..	310,000	3,100	100	.....	.....	.....	3,750,000	Jun. 1886	7.50
67	Ideal, s. L.	Colo.	1,500,000	150,000	10	.....	.....	.....	15,000	Oct. 1886	.05
68	Illinois, s.	N. M.	100,000	100,000	1	*	.....	.....	25,000	Jan 1887	.25
69	Independence, s.	Nev..	10,000,000	100,000	100	340,000	Oct. 1886	.20	225,000	Sept 1879	.25
70	Indian Queen, s.	Nev..	250,000	125,000	2	*	.....	.....	368,750	July 1883	.03
71	Invo, G.	Cal..	500,000	100,000	5	*	.....	.....	45,000	Apl. 1882	.05
72	Iron Hill, s.	Dak.	2,500,000	250,000	10	82,500	Oct. 1885	.....	112,500	Oct. 1886	.05
73	Iron-Silver, s. L.	Colo.	10,000,000	500,000	50	*	.....	.....	1,900,000	Mar. 1887	.20
74	Jackson, G. S.	Nev.	5,000,000	50,000	100	10,000	Nov. 1880	.20	45,000	Oct. 1883	.10
75	Jocuistita, s.	Mex.	2,500,000	250,000	10	.....	.....	.....	1,200,000	Feb. 1865	.50
76	Kentuck	Nev..	3,000,000	30,000	100	342,000	Nov 1881	.30	1,600,000	Dec. 1886	.10
77	La Plata, s. L.	Colo	2,000,000	200,000	10	*	.....	.....	610,000	Sept 1882	.30
78	Leadville Cons., s. L.	Colo.	4,000,000	400,000	10	*	.....	.....	410,000	Oct. 1886	.05
79	Lexington, G. S.	Mont	4,000,000	40,000	100	*	.....	.....	565,000	Jan. 1885	2.00
80	Little Chief, s. L.	Colo.	10,000,000	200,000	50	*	.....	.....	780,000	Mch 1885	.10
81	Little Pittsburg, s. L	Colo.	20,000,000	200,000	100	*	.....	.....	1,050,000	Mch. 1880	50
82	Manhattan, s.	Nev.	5,000,000	50,000	100	250,000	Mar. 1887	1.00	437,500	Feb 1886	.25
83	Marguerite, G.	Cal..	500,000	25,000	20	.....	.....	.....	18,750	Oct. 1882	.25
84	Marion Bullion, G	N.C.	500,000	.....	.....	.....	.....	.....	15,000	Jan. 1886	.....
85	Martin White, s.	Nev..	10,000,000	100,000	100	1,150,000	Mar. 1886	25	140,000	Dec. 1886	.25
86	Mary Murphy, G. S.	Colo.	350,000	3,500	100	*	.....	.....	70,000	Apl. 1887	5.00
87	Minnesota, C.	Mich	1,000,000	40,000	25	420,000	Apl. 1886	1 00	1,820,000	Mar. 1876	.....
88	Mono, G.	Colo.	5,000,000	50,000	100	585,000	Mar. 1887	.50	12,500	Mar. 1886	.25
89	Montana, Lt., G. S.	Mont	3,300,000	330,000	10	*	.....	.....	999,900	Jan. 1887	.02
90	Morning Star, s. L.	Colo.	1,000,000	100,000	10	.....	.....	.....	675,000	Dec. 1886	.25
91	Moulton, s. G.	Mont	2,000,000	400,000	5	*	.....	.....	320,000	Dec. 1886	.07½
92	Mount Piesasnt, G.	Cal.	150,000	150,000	1	*	.....	.....	150,000	Feb. 1887	.30
93	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500	Jun. 1880	2.00	80,000	July 1885	.20
94	Napa, Q.	Cal..	700,000	100,000	7	.....	.....	.....	290,000	Jan. 1883	.10
95	Navajo, G. S.	Nev..	10,000,000	100,000	100	450,000	Mar. 1887	.30	325,000	Feb. 1885	.25
96	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*	.....	.....	30,000	Dec. 1885	.06½
97	New York Hill, G.	Cal..	5,000,000	50,000	100	62,500	Oct. 1885	.15	215,000	Aug. 1882	.10
98	Northern Belle, s.	Nev..	5,000,000	50,000	100	425,000	Jan. 1884	8.30	2,400,000	Apl. 1883	50
99	North Belle Isle, s.	Nev..	10,000,000	100,000	100	250,000	Mar. 1887	.50	30,000	Aug. 1881	.15
100	Ontario, s. L.	Utah	15,000,000	150,000	100	.....	.....	.....	8,150,000	Mar. 1887	.50
101	Ophir, G. S.	Nev..	10,000,000	100,000	100	4,007,800	Dec. 1886	.50	1,595,000	July 1882	1.00
102	Original, s. C.	Mont	1,500,000	60,000	25	*	.....	.....	114,000	Oct.. 1884	.05
103	Osceola, C.	Mich	1,250,000	50,000	25	480,000	Apl. 1876	1.60	1,022,500	Jan. 1887	1.00
104	Oxford, G.	N. S.	125,000	125,000	1	*	.....	.....	34,500	Oct. 1885	.02
105	Paradise Valley, G. S	Nev.	10,000,000	100,000	100	47,000	Mar. 1882	.15	140,000	Nov. 1886	.10
106	Peacock, S. G. C.	N.M.	2,000,000	200,000	10	*	.....	.....	60,000	Nov. 1886	.....
107	Pleasant Valley, G. S.	Cal..	10,000,000	100,000	100	40,000	Mar. 1884	.10	30,000	Dec. 1882	.05
108	Plutus, G. S. C. L.	Colo.	2,000,000	200,000	10	*	.....	.....	20,000	Feb. 1886	.10
109	Plymouth Con., G.	Cal..	5,000,000	100,000	50	*	.....	.....	1,925,000	Apl. 1887	.25
110	Prussian, s. L.	Colo.	1,500,000	150,000	10	.....	.....	.....	132,000	Jan 1883	.10
111	Quicksilver, pref., Q.	Cal..	4,300,000	43,000	100	.....	.....	.....	849,650	Jan. 1887	1.50
112	" com., Q	Cal..	5,700,000	57,000	100	.....	.....	.....	151,000	July 1882	.40
113	Quincy, C.	Mich	1,000,000	40,000	25	200,000	Dec. 1862	.....	4,570,000	Jan 1887	4.00
114	Richmond, s. L.	Nev..	1,350,000	54,000	25	*	.....	.....	4,245,087	Dec. 1886	1.25
115	Ridge, C.	Mich.	500,000	20,000	25	220,000	Mar 1886	.50	10,000	Feb. 1880	.50
116	Rising Sun, s.	Dak..	750,000	150,000	5	*	.....	.....	52,000	May 1881	.07½
117	Robinson Con., s. L.	Colo.	10,000,000	200,000	50	*	.....	.....	585,000	Mar. 1886	.05
118	Robert E. Lee, s. L.	Colo	10,000,000	500,000	20	.....	.....	.....	100,000	Dec. 1882	.10
119	Rooks, G.	Vt..	500,000	50,000	10	*	.....	.....	61,000	Apr. 1885	.30
120	San Francisco, C.	Cal..	5,000,000	50,000	100	45,000	Sept 1883	.50	20,000	Feb. 1883	.05
121	Savage, s.	Nev..	11,200,000	112,000	100	6,156,000	Jun. 1886	.50	4,460,000	July 1869	3.00
122	Security L. Mg., Mfg.	Colo.	1,000,000	100,000	10	*	.....	.....	50,000	July 1884	.....
123	Shoshone, G.	Idah.	150,000	150,000	1	.....	.....	.....	7,500	Apl. 1883	.01
124	Sierra Buttes, G.	Cal..	225,000	22,500	10	.....	.....	.....	1,438,964	Oct. 1886	.37
125	Sierra Grande, s.	N. M.	2,500,000	500,000	5	.....	.....	.....	860,000	Sept 1884	.25
126	Sierra Nevada, G. S.	Nev..	10,000,000	100,000	100	6,212,000	Mar. 1887	.50	102,000	Jan. 1871	1.00
127	Silver Cord, G. S. L.	Colo.	5,000,000	500,000	10	.....	.....	.....	225,000	Nov. 1883	.25
128	Silver King, s.	Ariz.	10,000,000	100,000	100	.....	.....	.....	1,850,000	Feb. 1887	.25
129	Silverton, G. S. L.	Colo.	2,000,000	200,000	10	*	.....	.....	70,000	Nov 1886	.02
130	Small Hopes Cons., S.	Colo.	5,000,000	250,000	20	*	.....	.....	2,662,500	Mar. 1887	.20
131	Smuggler, S. L.	Colo.	600,000	60,000	10	.....	.....	.....	66,700	Aug. 1883	.25
132	Socorro, C.	N. M.	250,000	4,000	100	.....	.....	.....	4,000	Mch 1882	.00¼
133	South Yuba, G.	Cal..	2,000,000	40,000	50	*	.....	.....	150,000	Oct. 1881	.75
134	Spring Valley, G.	Cal..	240,000	240,000	1	50,000	Oct. 1886	.25	50,000	Jan. 1881	.25
135	Standard, G. S.	Cal..	10,000,000	1,000,000	100	25,000	Oct. 1884	.25	4,425,000	Mar. 1884	.25
136	Stormont, s.	Utah	500,000	500,000	1	*	.....	.....	155,000	Nov. 1881	.05
137	St. Joseph, L.	Mo..	1,500,000	150,000	10	*	.....	.....	754,000	Mar. 1887	.20
138	Syndicate, G.	Cal..	10,000,000	100,000	100	38,729	July 1882	.15	48,338	Sept 1885	.10
139	Tip Top, s.	Ariz.	10,000,000	100,000	100	250,000	Sept 1883	.25	100,000	Nov. 1881	.20
140	Tombstone, G. S. L.	Ariz.	12,500,000	500,000	25	*	.....	.....	1,250,000	Apl. 1882	.10
141	True Fissure, G. S. L.	Utah	1,500,000	150,000	10	*	.....	.....	75,000	Jun. 1883	.15
142	United Verde, C.	Ariz.	3,000,000	300,000	10	*	.....	.....	97,500	Feb. 1884	.20
143	Valencia, M.	N. M.	150,000	1,500	100	*	.....	.....	37,500	Apl 1886	2.50
144	Viola Lt., s. L.	Idah.	750,000	150,000	5	*	.....	.....	55,750	Feb. 1887	.12½
145	Vizina, s.	Ariz.	5,000,000	200,000	25	*	.....	.....	140,000	Apl. 1882	.10
146	Yankee Girl	Colo.	2,500,000	250,000	10	.....	.....	.....	1,075,000	Jan 1887	.05
147	Yellow Jacket, G. S.	Nev..	12,000,000	120,000	100	5,448,000	Dec. 1885	.75	2,184,000	Aug. 1871	1.50

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Value.	Assessments. Total levied to date.	Assessments. Date and amount per share of last
1	Agassiz Cons., s. L.	Colo.	$2,500,000	50,000	$50	*	.....
2	Albion, s. L.	Nev..	15,000,000	150,000	100	$577,000	July 1883 .50
3	Allouez, C.	Mich	2,000,000	80,000	25	240,000	Feb. 1884 .50
4	Alpha Con., G. S.	Nev..	3,000,000	30,000	100	445,000	Jan. 1887 .50
5	Alta, s.	Nev..	10,080,000	100,800	100	2,027,000	Feb. 1887 .50
6	Amador, G.	Cal..	400,000	200,000	2	*	.....
7	American Flag, s.	Colo.	1,250,000	125,000	10	300,000	Jun. 1877 .25
8	Anglo-Montana, Lt.	Mon.	600,000	120,000	5	.....	.....
9	Appalachian, Lt., G.	N. C.	1,500,000	300,000	5	.....	.....
10	Aspen Mg. & S., s. L.	Colo.	2,000,000	200,000	10	.....	.....
11	Barcelona, G.	Nev..	5,000,000	200,000	25	*	.....
12	Bear Creek.	Cal..	300,000	300,000	1	.....	.....
13	Bechtel Con., G.	Cal..	10,000,000	100,000	100	173,500	Jan. 1883 .10
14	Belmont, s.	Nev..	5,000,000	50,000	100	735,000	Apl. 18-6 .10
15	Best & Belcher, G. S.	Nev..	10,080,000	100,800	100	1,798,990	Mar. 1887 .50
16	Big Pittsburg, s. L.	Colo.	20,000,000	200,000	100	*	.....
17	Bi-Metallic, s.	Mon.	5,000,000	200,000	25	*	.....
18	Black Jack, G.	Cal..	250,000	100,000	2½	*	.....
19	Bonanza Chief	Mon	1,000,000	1,000,000	1	*	.....
20	Bondholder.	Colo.	500,000	200,000	2½	.....	.....
21	Boston Con., G.	Cal..	10,000,000	100,000	100	170,000	Nov 1883 .25
22	Bradshaw, s.	Ariz.	2,250,000	225,000	10	.....	.....
23	Brunswick, G.	Cal..	2,000 000	400,000	5	*	.....
24	Bullion, G. S.	Nev..	10,000,000	100,000	100	5,000,000	Jan. 1887 .40
25	Bve and Bye.	Ariz.	1,000,000	100,000	10	*	.....
26	Calaveras, G.	Cal..	500,000	500,000	1	*	.....
27	Carisa, G.	Colo.	500,000	100,000	5	*	.....
28	Cen Contin'l, G. S. L.	C. & A	2,000,000	200,000	10	*	.....
29	Charles Dickens.	Idah.	1,250,000	250,000	5	.....	.....
30	Cherokee, G.	Cal..	1,500,000	150,000	10	.....	.....
31	Chollar, s.	Nev..	11,200,000	112,000	100	1,096,000	Nov 1886 .50
32	Cinnamon Mt., G. S.	Colo.	750,000	150,000	5	*	.....
33	Climax, s. L.	Colo.	2,000,000	200,000	10	*	.....
34	Colorado No. 2, s. L.	Colo.	100,000	10,000	10	.....	.....
35	Con. Imperial, G. S.	Nev..	50,000,000	500,000	100	1,100,000	Aug. 1886 10
36	Con. Pacific, G.	Cal..	6,000 000	60,000	100	174,000	Feb. 1886 .15
37	Cons Silver, s.	Mo..	2,500,000	250,000	10	.....	.....
38	**Cop. Queen Cons, C.	Ariz	1,400 000	140,000	10	.....	.....
39	Courtlandt.	Colo.	500,000	50,000	10	.....	.....
40	Crescent, s. L.	Colo.	3,000,000	300,000	10	*	.....
41	Crocker, s.	Ariz.	10,000.000	100,000	100	65,000	May 1886 .20
42	Crowell. G.	N. C	500,000	500,000	1	.....	.....
43	Dahlonega, G.	Ga...	250,000	250,000	1	*	.....
44	Dandy, s.	Colo.	5,000,000	500,000	10	.....	.....
45	Dardanelles, G.	Cal..	1,000,000	100,000	10	.....	.....
46	Decatur, s.	Colo.	1,500,000	300,000	5	*	.....
47	Denver City, s. L.	Colo.	5,000,000	500,000	10	*	.....
48	Denver Gold.	Colo.	300,000	60,000	5	.....	.....
49	Deseret, G. S.	Utah	500,000	50,000	10	*	.....
50	Dunderberg, s.	Colo.	1,500,000	150,000	10	*	.....
51	Durango, G.	Colo.	500,000	500,000	1	*	.....
52	Durango T.	Mex.	120,000	1,200	100	.....	.....
53	Eastern Dev. Co., Lt.	N. S.	1,500,000	150 000	10	990,000	Mar. 1886 1.00
54	El Cristo, G. S.	U.S.C	1,000,000	500,000	2	.....	.....
55	Empire Lt., G.	Mon.	500,000	150,000	5	.....	.....
56	Empire, s.	Utah	10,000,000	100,000	100	*	.....
57	Enterprise, s. L.	Colo.	800,000	80,000	10	*	.....
58	Eureka Tunnel, s. L.	Nev..	10,000,000	100,000	100	*	.....
59	Exchequer.	Nev.	10,000,000	100,000	100	860,000	Oct. 1886 .20
60	Gold Cup, s	Colo.	500,000	500,000	1	*	.....
61	Gold Placer, G.	Colo.	5,000,000	200,000	25	229,314	Dec. 1885 .25
62	Goodshaw, G.	Cal..	10,000,000	100,000	100	*	.....
63	Grand Belt, C.	Tex.	12,000,000	120,000	100	.....	.....
64	Grand Duke.	Colo.	800,000	80,000	10	.....	.....
65	Gregory-Bobtail, G.	Colo.	550,000	550,000	1	*	.....
66	Gregory Con., G.	Mon.	3,000,000	300,000	10	.....	.....
67	Hariem M. & M. Co, G.	Cal..	1,000,000	200,000	5	.....	.....
68	Head Cent. & Tr. s. G	Ariz.	10,000,000	100,000	100	.....	.....
69	Highland, C.	Mich	500,000	125,000	25	.....	.....
70	Hortense, s.	Colo.	2,000,000	200,000	10	.....	.....
71	Iron Gold & Silver, s	N. M.	2,000,000	200,000	10	.....	.....
72	Iroquois, C.	Mich	1,250,000	50,000	25	.....	.....
73	J. D. Reymert.	Ariz	10,000,000	100,000	100	*	.....
74	Julia Cons., G. S.	Nev..	11,000,000	110,000	100	1,438,000	Nov 1885 .10
75	Kearsarge, C.	Mich	1 250,000	50,000	25	100,000	Apl. 1886 5.00
76	Laclede.	N. M.	2,000,000	200,000	10	.....	.....
77	Lacrosse, G.	Colo.	1 000,000	100,000	10	*	.....
78	Lee Basin, s. L.	Colo.	5,000,000	500,000	10	*	.....
79	Leviathan, s.	Nev..	10,000,000	100,000	100	380,000	Sept 1882 .25
80	Lucerne, s.	Colo.	5,000,000	500,000	10	*	Jan. 1885 .10
81	Mammoth Bar., G.	Cal..	10,000,000	100,000	100	50,000	Dec. 1881 .....
82	Mariposa pref., G.	Cal..	5,000,000	50,000	100	1,687,500	Feb. 1883 .25
83	" common, G.	Cal..	10,000,000	100,000	100	1,975,000	Dec. 1881 .20
84	May Belle, G.	Cal..	10,000,000	100,000	100	84,000	Mar. 1886 .15
85	Mayflower Gravel.	Cal..	1,000,000	100,000	100	160,000	Mar 1887 .25
86	Mexican, s. S.	Nev..	10,000,000	100,800	100	2,590,960	Jan 1887 .25
87	Middle Bar, G.	Cal.	400,000	200,000	2	*	.....
88	Mike & Starr, s. L.	Colo.	1,000,000	200,000	5	*	.....
89	Miner Boy, G. S. L.	Colo.	5,000,000	500,000	10	*	.....
90	Miller.	Nev.	5,000,000	200,000	25	*	.....
91	Moose Silver, s.	Colo.	3,000,000	300,000	10	*	.....
92	Nachoochee, Lt., G.	Ga..	1,000,000	200,000	5	.....	.....
93	Neath, G.	Colo	1,000,000	100,000	10	*	.....
94	New Germany, G.	N. S.	100,000	100,000	1	*	.....
95	New Pittsburg, s. L.	Colo.	2,000,000	200,000	10	*	.....
96	North Standard, G.	Cal..	10,000,000	100,000	100	20,000	Nov .....
97	Noonday.	Cal..	600,000	60,000	10	208,000	Dec. 1881 .10
98	Old Dominion, C.	Ariz.	3,000,000	300,000	10	.....	.....
99	Oriental.	Nev..	2,000,000	200,000	10	.....	.....
100	Oriental & Miller, s.	Nev..	10,000,000	400,000	25	.....	.....
101	Overman, G. S.	Nev..	11,520,000	115,200	100	3,736,880	Jan. 1887 .30
102	Parrott, C.	Mon.	1,800,000	180,000	10	.....	.....
103	Park, s.	Utan	2,000,000	200,000	10	.....	.....
104	Peer, s.	Ariz.

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	March 26.		March 28.		March 29.		March 30.		March 31.		April 1.		SALES.
	H.	L.	H.	L.	H	L.	H.	L.	H.	L.	H.	L.	
Alice, Mon	.....	.....	.....	.....	.....	.....	1.50	.....	.....	.....	.....	.....	100
Argenta, Nev	.....	.....	.....	.....	.30	.....	.....	.....	.....	.....	.....	.....	300
Bassick, Colo	.....	.....	.....	.....	.....	.....	.12	.....	.13	.....	.14	.....	500
Belle Isle, Nev	.....	.....	.88	.88	.86	.70	.....	.....	.75	.....	.....	.....	4,900
Bodie Cons., Cal	.....	.....	.....	.....	2.50	2.45	.....	.....	.....	.....	.....	.....	200
Breece, Colo	.63	.60	.64	.60	.62	.60	.67	.60	.68	.66	.72	.68	7,500
Bulwer, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Caledonia, Dak	.....	.....	1.30	.....	.....	.....	1 30	.....	1.25	1.20	.....	.....	550
Chollar, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chrysolite, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colorado Cent'l, Colo	.....	.....	2.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Cons. Cal. & Va., Nev	16.00	.....	15.25	.....	.....	.....	14.13	.....	13.00	.....	.....	.....	560
Crown Point, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Deadwood, Dak	2.00	.....	.....	.....	.....	.....	2.15	2.10	.....	.....	.....	.....	600
Dunkin, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.38	.....	200
Eureka Cons., Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Father de Smet, Dak	.74	.....	.70	.....	.....	.....	.....	.....	.....	.....	.....	.....	400
Freeland, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gold Stripe, Cal	.....	.....	.....	.....	.03	.....	.04	.....	.....	.....	.....	.....	2,200
Gould & Curry, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Green Mountain, Cal	.41	.....	.41	.40	.....	.....	.41	.....	.....	.....	.....	.....	500
Hale & Norcross, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Homestake, Dak	14.75	.....	.....	.....	15.25	.....	.....	.....	15.00	14.25	15.00	.....	420
Horn-Silver, Ut	.....	.....	.....	.....	1.25	.....	1.25	.....	.....	.....	.....	.....	600
Independence, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron Hill, Dak	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron Silver, Colo	2.85	.....	.....	.....	.....	.....	2.90	2.80	2.75	.....	.....	.....	600
Leadville C., Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Little Chief, Colo	.....	.....	.29	.....	27	.....	.29	.28	.32	.30	.32	.30	9,900
Little Pittsburg, Colo	.....	.....	.....	.....	.40	.....	.46	.45	.50	.....	.51	.45	3,900
Martin White	.....	.....	.....	.....	.....	.....	.....	.....	.74	.....	.....	.....	200
Moulton, Mont	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Navajo, Nev	1.45	1.15	1.15	1.05	1.10	1.05	1 15	.....	.....	.....	1.00	.95	2,050
North Belle Isle, Nev	.....	.....	7.50	.....	8 13	.....	7.50	.....	.....	.....	.....	.....	250
Ontario, Ut	.....	.....	.....	.....	23.00	.....	.....	.....	.....	.....	25.00	.....	200
Ophir, Nev	.....	.....	.....	.....	.....	.....	.....	.....	6.13	.....	.....	.....	3
Plymouth, Cal	17.75	.....	.....	.....	.....	.....	.....	.....	17.75	17.63	18.00	17.87	750
Quicksilver Pref., Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" Com., Cal	.....	.....	.....	.....	.....	.....	6.25	.....	.....	.....	.....	.....	100
Robinson Cons., Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Savage, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sierra Nevada, Nev	.....	.....	3.90	3.75	.....	.....	.....	.....	.....	.....	2.90	.....	350
Silver King, Ariz	.....	.....	.....	.....	8.50	.....	9.50	.....	.....	.....	9.75	9.50	165
Standard, Cal	1.00	.....	1.00	.....	.....	.....	.....	.....	1.25	.....	1.00	.....	500
Stormont, Ut	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yellow Jacket, Nev	.....	.....	.....	.....	4.50	.....	.....	.....	.....	.....	.....	.....	10
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	March 26.		March 28.		March 29.		March 30.		March 31.		April 1.		SALES.
	F.	L.	H.	L.	H.	L.	H	L.	H.	L.	H.	L.	
Amador, Cal	2.30	2.20	2.35	2.25	2 35	2.25	2.35	2.20	2.20	1.95	2.10	2.00	32,000
Am. Flag, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	900
Barcelona, Nev	.35	.32	.34	.33	.39	.35	.42	.40	.42	.41	.40	.39	12,500
Bechtel Con., Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belcher, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Best & Belcher, Nev	.....	.....	.....	.....	.....	.....	.....	.....	5.50	.....	.....	.....	55
Big Pittsb'g, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bullion, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bull-Dom'go, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Castle Creek, Id	.18	.....	.25	.19	.30	.26	.28	.27	.27	.....	.....	.....	13,700
Central Ariz., Ariz	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Columbia & Beaver	.....	.....	.....	.....	.05	.04	.05	.....	.06	.....	.06	.....	23,600
Cons. Imperial, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Pacific, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Decatur	.....	.....	.....	.....	.....	.....	.....	.....	.01	.....	.01	.....	3,000
Durango	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.03	.....	1,000
Eastern Oregon	.....	.....	.03	.....	.04	.02	.03	.....	.04	.03	.03	.....	16,450
El Cristo, U. S. Col	7.00	3.50	6.50	5.50	6.38	5.87	6.75	6.25	6.75	6.25	6.63	6.00	29,500
Gold Placer	.....	.....	.....	.....	.....	.....	.03	.02	.04	.02	.03	.02	54,000
Helena	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Holyoke	.31	.24	.31	.29	.31	.29	.32	.30	.31	.24	.25	.24	89,000
Julia, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.70	.....	200
Justice, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kossuth, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.14	.....	300
Lacrosse, Colo	.....	.....	.....	.....	.15	.....	.16	.15	.16	.....	.16	.15	4,900
Mexican, Nev	.....	.....	.....	.....	5.00	.....	.....	.....	4.0	3 70	.....	.....	280
Middle Bar, Cal	1.30	1.20	1 35	1 25	1.40	1.35	1.40	1.20	1.25	1.00	1.10	1.05	85,700
Mono, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 55	.....	100
New Germany, N.S.	.52	.....	.53	.....	.53	.52	.53	.50	.54	.52	.53	.52	14,600
New Pittsb'g, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Stand'd, Cal	.....	.....	.....	.....	.....	.....	.....	.....	12	.....	.....	.....	100
N. Horn-Silv'r, Ut	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ori'nt'l & Mil'r, Nev	.24	.....	.....	.....	.....	.....	22	.....	22	.....	22	.....	1,400
*Phœnix, Ariz	4.50	4.00	5 00	4 25	5 62	4.50	5.12	4.75	5.00	3.87	4 62	4.00	63,425
Potosi, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rappahannock, Va	.15	.....	.17	.15	.17	.16	.17	.16	.17	.....	.17	.16	22,900
Red Eleph't, Colo	.05	.....	.05	.....	.05	.....	.07	.05	.05	.....	.....	.....	45,700
Saint Kevin	.72	.61	.75	.61	.75	.65	.74	.68	.73	.60	.70	.59	32,620
Santiago	4.00	3.75	4.30	4.10	4.50	4.35	4.60	4.50	4.50	3.50	3.75	3.50	25,850
Security, Colo	6.12	5.75	6.00	5.75	6.00	5.62	5.87	5.50	5.75	5.50	6.50	5.50	10,055
Silver Cliff, Colo	.....	.....	.16	.15	.17	.15	.18	.16	.18	.17	.17	.....	7,300
Silver Queen	.....	.....	.21	.20	.20	.....	.20	.....	.18	.15	.19	.....	5,600
Sonora Con., Mex	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stanislaus, Cal	3.05	2 95	3 10	3.00	3.25	3.10	3.40	3 20	3.50	3.25	3.45	3 15	12,500
State L'e, I. & S., Nev	.05	.....	.04	.....	.04	.....	.05	.....	.....	.....	.....	.....	3,000
" Nos. 2 & 3, Nev	.07	.....	.07	.....	.06	.....	.06	.05	.....	.....	.....	.....	2,800
Sutro Tunnel, Nev	.21	.20	.21	.20	.30	.22	.29	.26	.28	.23	.25	.23	81,600
Taylor Plumas, Cal	.08	.07	.08	.07	.08	.07	.08	.07	.10	.08	.09	.08	34,000
Unadilla, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union Cons., Nev	.....	.....	3.55	.....	.....	.....	2.80	.....	.....	.....	.....	.....	200
Utah, Nev	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Dealt in at the New York Stock Exchange Unlisted Securities.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Mar. 25.		Mar. 26.		Mar. 28.		Mar. 29.		Mar. 30.		Mar. 31.		SALES.
Amie	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Allouez	2.00	.....	1.87	.....	2.00	.....	.....	.....	1.87	.....	1.87	1.75	1,150
Atlantic	9.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	10.00	.....	70
Bodie	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bonanza D	1.50	.....	1.50	.....	1.50	.....	1.63	.....	1 62	.....	1.63	1.50	1,950
Boston & Montana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Breece	.65	.....	.62	.....	.62	.60	.65	.60	.65	.....	.75	.65	3,800
Calumet & Hecla	214	.....	214	.....	.....	.....	.....	.....	211	.....	210⅛	.....	27
Catalpa	.36	.....	36	.....	.....	.....	.35	.....	.35	.....	.33	.....	920
Central	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chrysolite	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Virginia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunkin	.30	.....	.39	.38	.39	.....	.40	.39	.40	.....	.40	.35	3,225
Eureka	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Franklin	11.00	.....	11.12	.....	11.12	11.00	11 25	11.00	.....	.....	11.50	11.00	550
Freeland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Helena	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Honorine	.80	.....	.80	.....	.82	.....	.....	.....	.....	.....	.85	.....	1,000
Kearsage	8.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	250
Osceola	22.50	22.00	.....	.....	23.00	.....	23.00	.....	.....	.....	23 00	.....	270
Pewabic	.....	.....	.....	.....	.....	.....	.....	.....	2.13	2.00	.....	.....	300
Quincy	.....	.....	50.00	.....	49.87	49.75	50.00	49.75	.....	.....	50.00	49.75	177
Robinson	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Security	.....	.....	5.75	.....	.....	.....	.....	.....	5.75	.....	.....	.....	200
Silver King	.....	.....	.....	.....	.....	.....	.....	.....	8.50	.....	.....	.....	25
Standard	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stormont	.12	.....	.12	.....	.12	.....	.....	.....	.....	.....	.12	.....	1,300

NAME OF COMPANY.	Mar. 25.		Mar. 26.		Mar. 28.		Mar. 29.		Mar. 30.		Mar. 31.		SALES.
Alma	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arnold	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bijou	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Blue Ridge	.20	.....	.....	.....	.....	.....	.....	.....	.....	.19	.....	.....	400
Bowman Silver	.....	.....	.11	.....	.....	.....	.11	.....	.....	.....	.....	.....	900
Cliff	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Pacific	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crescent	.....	.....	.....	.....	.....	.....	.13	.12	.....	.....	.....	.....	200
Cusi	.....	.....	.24	.....	.....	.....	.25	.22	.....	.....	.....	.....	1,700
El Cristo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Empire	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fern	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Holyoke	.....	.....	.....	.....	.....	.....	.04	.....	.....	.....	.....	.....	500
Huron	.....	.....	1.50	.....	1.50	.....	.....	.....	.....	.....	1.00	.....	205
Mesnard	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mona	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Napa	1.00	.....	1.00	.....	.....	.....	1.00	.....	.....	.....	1.00	.....	600
National	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Native	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oriental & Miller	.....	.....	.....	.....	.....	.24	.....	.24	.....	.25	.....	.23	1,100
Plato	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ridge	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rappahannock	.....	.....	.....	.....	.....	.17	.....	.18	.....	.18	.....	.18	1,100
St. Mary's	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sutro Tunnel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.28	.....	.27	600
Tamarack	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Taylor Plumas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	09	30

New York: Dividend shares sold, 38,635. Non-dividend shares sold, 731,235. Total New York, 769,870.
Boston: Dividend shares sold, 15,214. Non-dividend shares sold, 7,605. Total Boston, 22,819.

COAL STOCKS.

NAME OF COMPANY.	Par value of shares.	March 26.		March 28.		March 29.		March 30.		March 31.		April 1.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Barclay Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cameron Coal	50	46	45	45⅛	.....	45⅛	.....	45	.....	45⅛	.....	.....	.....	800
Col., C. & I	100	40¼	39½	41¼	40⅝	41	40⅝	41⅜	40¾	42	41½	42¼	41½	24,015
Ches. & O. RR	100	.....	.....	8⅞	8½	.....	.....	.....	.....	.....	.....	.....	.....	250
*Chic. & Ind. Coal RR	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. & Hocking Coal	.....	41⅝	...	42¼	41⅝	44½	42½	46½	44⅞	47¼	46¼	47	46	25,530
Consol. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cumb. C. & I	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & H. C	100	101¾	101¼	101⅞	101⅝	102	101¼	101⅞	101⅝	102	101¾	102⅛	101⅞	5,683
D., L. & W. RR	50	136¼	135½	136⅜	136¼	136⅜	135¼	136⅛	135⅝	136¼	134	135⅛	134¼	80,976
Elk Lick Coal Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hocking Valley	100	32	30⅝	32⅛	31¼	32	31⅝	32	31½	32	31½	32¼	31¾	6,045
Lehigh C. & N.†	50	.....	.....	50⅛	.....	50⅛	.....	50⅝	.....	50½	50¼	.....	.....	738
Lehigh Valley RR.†	50	56	55¾	55⅞	55½	55⅛	55⅝	55½	.....	55⅝	.....	.....	.....	765
L. & W. C. & I. Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland Coal	100	14	13	14	13½	.....	.....	.....	.....	.....	.....	.....	.....	200
Montauk Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex	50	138½	138	.....	.....	.....	.....	.....	.....	.....	.....	138	.....	700
New Central Coal	100	.....	.....	.....	.....	.....	.....	14	.....	.....	.....	.....	.....	100
N. J. C. RR	100	72¼	71	73	72	72¾	72	72⅝	71⅛	73	72⅝	74	72½	38,402
N. Y. & S. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y., Susq. & Western	100	13⅝	13¼	13½	13⅜	13¼	.....	13⅜	13¼	13¼	.....	13	.....	5,010
Do. pref	100	36⅞	36⅝	37½	36⅞	37	36⅞	37	36¾	37	36¾	37¼	37	4,300
N. Y. & Perry C. & I	100	71⅞	.....	71⅞	.....	71¾	71½	.....	.....	71⅞	.....	.....	.....	1,200
Norfolk & Western R R	100	21	20½	22	21⅛	22	21¼	21⅞	21½	22	21¼	21⅞	21⅝	4,306
Do. pref	100	49½	48⅛	51	49⅝	50¾	50	50½	49¾	50⅝	49⅝	50½	50	13,700
Penn. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. RR.†	50	58⅜	58	58⅛	58⅜	58¾	58⅛	58¾	58⅝	58¾	58¼	.....	.....	12,666
Ph. & R. RR.**	50	38⅞	38⅝	39⅝	39	39¼	39	39¼	38⅞	39½	38⅞	39⅛	39	666,507
Spring Mountain	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee C. & I. Co	100	47¼	46½	47⅝	46½	47¼	47	47¼	.....	47¾	46¼	47⅜	47	4,880
Westmoreland Coal†	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

** Of the sales of this stock, 33,812 were in Philadelphia, and 132,695 in New York.
† The quotations for these stocks are not percentage, but actual price.
* Dealt in at the New York Stock Exchange, Unlisted Securities.

Total sales, 896,773.

San Francisco Mining Stock Quotations.

COMPANY.	CLOSING QUOTATIONS.					
	Mar. 25.	Mar. 26.	Mar. 28.	Mar. 29.	Mar. 30.	Mar. 31.
Albion	.....	.....	.....	.....	.....	.....
Alpha	.....	.....	.....	.....	.....	.....
Alta	2⅛	2⅛	2	2	2	2
Argenta	.....	.....	.....	.....	.....	.....
Bechtel	.....	.....	.....	.....	.....	.....
Belcher	.....	.....	.....	.....	.....	.....
Belle Isle	.....	.....	.....	.....	.....	.....
Best & Belcher	7¾	8⅛	6½	6⅝	5⅞	5¼
Bodie	2½	2½	2⅝	2¼	2¼	2⅛
Bulwer	.....	1¼	1⅜	1¼	1¼	1¼
Challar	5¾	6⅛	5¾	5¾	5¾	5⅝
Con. Cal. & Va.	15	15	13¾	14¼	12⅞	13⅛
Con. Pacific	.....	.....	.25	.....	.....	.20
Crown Point	3⅞	4	3¾	3⅝	3¾	3½
Eureka Cons	.....	.....	.....	.....	.....	.....
Gould & Curry	4	4¼	3⅝	3¾	3⅝	3
Grand Prize	.....	.....	.....	.....	.....	.....
Hale & Norcross	4⅛	4½	4	4	3⅝	3¼
Martin White	.....	.....	.....	.....	.....	.....
Mexican	5½	5⅝	4⅝	4⅝	4	3¼
Mono	2¼	.....	2	2	2	1½
Mount Diablo	4	.....	.....	4¼	4¼	4⅛
Navajo	1⅝	1⅝	1¼	1¼	1¼	1
Ophir	8⅝	8¾	7¾	7⅝	6⅝	5⅞
Potosi	6⅞	7¼	6½	6¾	6½	6¼
Savage	5⅝	6½	5¾	5¾	5¼	4¾
Scorpion	.....	.....	.....	.....	.....	.....
Sierra Nevada	3¾	3¾	3¼	3½	3	2¾
Sutro Tunnel	.....	.....	.....	.....	.....	.....
Tip Top	.....	.....	.....	.....	.....	.....
Union Cons	3	3¼	3	3	2⅝	2⅛
Utah	1⅛	1⅛	1⅛	1¼	1	.90
Yellow Jacket	4¾	4½	4	4¼	4	3¾

larger, and the price of the stock fell correspondingly. Harpending's persistent bid of $9⅝, though still resounding through the crowd, became less and less audible. In the face of this bid, the price was observed to break. At first there were offers of the stock at $9¼, then at $9, at $8⅞, at $8¾, at $8½, at $8¼. By eighths and quarters lower the stock was offered until the quotations stood at $4.50, a drop of over 50 per cent in a twinkling! The oil men surged around here, there and everywhere. Hix, Beebe, Nelson, Taylor, Rice, Lauterbach, Kingsbury and other dealers in the grease were now in the mining crowd. The stock traders abandoned operations and came over to take part in the fray. Operations in all other mining shares came to an end. Harpending was powerless to stem the tide that set in against him. De Forest stood by his side endeavoring to calm the mob, but without avail. Offers of the stock were being made at lower and lower prices, regardless of Harpending's offer. Like wild men, the crowd swayed around him, heedless of his efforts, and bent only upon "busting" the stock. They succeeded. Meanwhile the impression gained ground that the smash had been brought about by the insiders. One rumor was that Harpending had "skedaddled," leaving his companions in the lurch, after pocketing the proceeds of the deal to the extent of half a million dollars. All this proved erroneous. The break was brought about by the "oil crowd." It appears that Harpending, to encourage the traders, had been selling largely of "puts" on the stock at $9 at a charge of $5 and $10 per hundred shares. Stagnation having prevailed in the oil market for some time, many of the oil men, holders of these "puts," determined to raid the market. This they did successfully by means of washed sales. Of the 20,000 shares of El Cristo alleged to have changed hands during the break, all but 2000 are believed to have been "washed." The oil men did the business. Had Harpending anticipated such a movement he would undoubtedly, by means of a score of brokers posted in the crowd, have prevented serious results. As it was, the mob swept the field, and Harpending was left as helpless as an infant on the ocean. What Harpending might and should have done was what many were prepared to suggest after the trouble was over. The fact is, that Harpending did the best possible. No individual could have withstood the onslaught of the mob surrounding him on that fatal day. For two hours after exchange hours, big crowds lingered about the building. H. A. Paterson, from an elevated position, denounced the proceedings of the afternoon as disgraceful and the men who took part in it as "hogs." Harpending, being called upon, declared his inability to check the current which had swept before him, notwithstanding his persistent bidding for any part of 5000 shares at $9⅝, the mob continually offering the stock at lower figures. "Gus" Rice, in stentorian tones, wanted to wager that El Cristo "owned no mine at all," and skulked off, when a bystander offered to bet that Rice was a quadruped with long ears. The circus was kept up until 5 P.M. Badeau was there; so was Mendels, Lounsbery, Raphall, Moller, Hoagland, Morse, Harry Cook, De Aguero, Macpherson—in fact all branches of the Exchange were represented. Later on it was rumored that Harpending would take the Pacific express for Chicago. He did nothing of the kind. On the following morning the holders of "puts" who had raided the market, tendered their stock at $8 and $9, all of which was promptly accepted and paid for. It is said he lost $200,000 through the raid, though as to this opinions will differ according as the view be taken that the raid was "accidental" or that it was skillfully instigated by the manipulators of the boom.

The mining market continues active, and much interest is displayed in the dealings. Prices in the beginning of the week showed a higher tendency, but toward the close they were lower.

In another column we refer to a meeting of the stockholders of the Alice Gold and Silver Mining Company, recently held at Salt Lake City. The arrangement perfected at this meeting is undoubtedly a liberal one, if the properties are worth the money; and it has greatly pleased the large New York interests, and has earned many complimentary opinions for Mr. Robert Walker, who now holds the sole control of the Alice administration from the Walker Brothers.

The prospects of this company are improved, and dividends are confidently expected from May on. A hundred shares of the stock sold this week at $1.50 per share.

We have received inquiries asking for information relating to the financial standing of the Rappahannock Gold Mining Company. We are informed by its officers that the company has a debt of about $20,000, mainly due to the president and vice-president. This money has been expended in increasing the mining plant and further developing the underground workings, by sinking shafts and running levels. There is no other class of debt whatever; the company pays cash for everything required. The company could now pay off the debt above mentioned at the rate of about $1200 per month, but the monthly profits now being made will be expended (for a couple of months at least) in sinking *another hundred feet* on the vein, and extending a level thereon, so that the mine will be able to produce enough ore to keep 20 *stamps* running steadily. The company now have a 10-stamp mill, but it is the intention to add 10 more during the present year. The prospects of the company never were so bright as at the present time. The stock, as usual, has been active, and large sales were made at from 15@17c.

The Phœnix appears to be reduced to nearly the last ditch, judging from its having to get an expert report on the value of the property by the notable, if not notorious, Benj. F. Butler. Just why the company should get Gen. Butler to report upon a subject of which his statements show conclusively he is entirely ignorant, is one of those things that are past finding out—except, indeed, as has been suggested, it is *because* he does not know any thing about a mine, and that his indorsement of this particular mine is in the market. The well-known *penchant* of the company for buying favorable opinions and indorsements lends probability to this explanation. "Ben's" letter seems to have had a strengthening effect on the price of the stock, which, before its appearance, declined from $5.62 to $3.87, and since then has advanced to $4.62. The last sale to-day was at $4.50. Over 63,000 shares changed hands during the week.

The Black Hill stocks are quiet. Deadwood is selling at from $2@$2.15; Homestake from $14.25@$15.25; Father De Smet at from 70@74c., and Caledonia from $1.20@$1.30.

Santiago, of which we gave full particulars in our last issue, was brought out Saturday at $3.75, and rapidly advanced to $4.60, the highest point being reached on Wednesday, since then the stock has declined, and closed at $3.50. The transactions amounted to 25,850 shares.

At the annual election of the Sutro Tunnel Company, held in San Francisco, on the 28th ult., the following trustees were elected: Moritz Meyer, Frederick Roeding, John Sanders, David Kohn, Mountford S. Wilson, Pellam W. Ames, and William Johns. Five of them were elected by Theodore Sutro, who represents a majority of the eastern stockholders by proxies. The stock has attracted considerable attention and advanced to 30c. on Tuesday; since then it has declined, and closed to-day at from 23@25c. The sales amounted to 81,600 shares. Consolidated California & Virginia continues its downward move, and went from $16 to $13. There is no apparent reason for this decline, as the reports from this property are favorable, and large shipments of bullion continue to be made. Mexican is also lower, at from $5 to $3 70; Union Consolidated from $3.55 to $2.80, and Sierra Nevada from $3.90 to $3.75. Best & Belcher was firm at $5.50; Yellow Jacket at $4.50, and Ophir at $6.13. A sale of Martin White, which is rarely quoted in this market, was made this week at 74c.

State Line 1 & 4 and 2 & 3 shows some business, the former at from 4@5c., and the latter from 5@7c. Oriental & Miller is quoted at from 22c. to 24c.

North Belle Isle advanced from $7.50 to $8.13, and declined again to $7.50. Belle Isle from 88c. to 70c., closing at 75c., and Navajo from $1.45 to 95c.

Mr. Andrew R. Culver and Mr. Allan C. Washington, President and Treasurer of Culver's Coney Island road, who are large stockholders in the Horn-Silver Mining Company, are putting themselves in communication with the other stockholders and preparing communications for the next meeting of the company, with a view of obtaining information in reference to the missing $650,000, to which we referred in our issue of March 12th. The stock has been quiet, selling at $1.25. Ontario is quoted at $25.

The story of "El Cristo in the Bear Garden" will be interesting reading to many. It gives a true picture of the scene, and we only regret that we were not able to illustrate the same and give the portraits of some of the leading "bears" and "bulls." The comparatively low price of the stock was of short duration, and on Saturday it again began its upward movement and has since been firm at from $3.50 to $7, selling to-day from $6 to $6.63, with transactions of 29,500 shares. Many prominent people are interested in this stock, among them "Deacon" S. V. White, who is said to hold some 50,000 shares. The "cotton men" are also represented, and Messrs. Williamson & Black hold some 20,000 shares.

Mr. Carleton's report on another page is extremely "rosey" and through the mine is apparently a good one, might perhaps be improved by a little toning down in the "estimates" and in the use of adjectives.

The stock of the St. Kevin Mining Company, which made its first appearance among the unlisted securities at the Stock Exchange last week, at 50c., advanced to 75c. on Tuesday, and since then declined to 59c.; the closing price to-day was 67c. The company's property is situated in the St. Kevin District, about seven miles northwest of Leadville, Colo. Considerable work has been done on the property, with satisfactory result, it is stated. The capital stock is $100,000; shares, $1 each, non-assessable.

Among the other Colorado stocks, Red Elephant was the most active, and created considerable fun at from 5@7c. Little Chief was next in line. The price advanced from 27@32c. Breece was active at from 60@72c.; Little Pittsburg at from 40@51c.; Lacrosse at 15@16c. Iron Silver holds its own at from $2.75@$2.90, and Colorado Central at $2.75.

Security ranged from $5.50@$6.50. There is no improvement shown in the mine or its prospects, which are of the bluest; but it is understood that the stock is nearly all pooled until September next, and none can be withdrawn from the pool until it has reached $10.

While the mine is apparently of very little value, it is not safe to short the stock. The wise man will let it absolutely alone.

The interest in Middle Bar and Amador is unabated, and both stocks continue to be among the most active on the list. In the beginning of the week higher prices were the rule, but toward the close there has been a declining tendency. Middle Bar advanced from $1.20 @$1.40, closing at $1.05; Amador from $2.20@$2.35, closing at $2. On another page will be found a letter relating to those properties.

Stanislauz has been higher at from $2.95 to $3.45. Plymouth is firm at from $17.63 to $18. Taylor Plumas attracts considerable attention, selling at from 7 to 10c. Green Mountain at 40@41c. Gold Stripe at 3@4c. One sale of Quicksilver Common was made at $6.25. Of the Bodies only Bodie Consolidated and Standard were represented in this week's transactions, the former selling at from $2.45 to $2.50 and the latter from $1 to $1.25.

Some activity has been displayed in Castle Creek. The price has advanced from 18@30c, the last sale being made at 27c. Holyoke shows a large business, sales of 89,000 shares, at prices ranging from 24@31c.; closing price 24c.

Coal Stocks.

Earlier in the week the feeling gained ground that money would not become tight, and that the leading operators had discounted any prospective advance in the interest rate. This resulted in a very bullish feeling, and considerable buying of stocks. London is again credited with buying, and Chicago and Boston have done much to make our market lively. A strong Chicago party of speculators has turned up here for the purpose of especially bulling the granger stocks. The feeling at the close to-day, although prices were off from the highest, was quite bullish for the next week at least.

The anthracite coal properties have only responded to the general advance, and have not been especia features. There is some bullish talk from good sources on Reading. The company's earnings are looking up. The amount of securities which have not assented to the reorganization plan are now so small that they can easily be purchased if needs be.

Hocking Coal and Iron, Colorado Coal, Kingston & Pembroke, and Indiana Coal and Railroad, have been features to the market, showing good advances.

Meetings.

The annual and special meetings of the following companies will be held at the times mentioned:

Bulwer Consolidated Mining Company, Room 29,

Nevada Block, No. 309 Montgomery street, San Francisco, Cal., April 13th, at one o'clock P.M.

Coalburg Coal and Coke Company, Birmingham, Ala., April 7th, at twelve o'clock M.

Copper Queen Mining Company, Nos. 37 and 39 Wall street, New York City, April 11th, from twelve to one o'clock P.M.

Senate Mining and Smelting Company, No. 50 Exchange place, New York City, April 20th, at three o'clock P.M., for the purpose of considering upon an agreement to consolidate Senate Mining and Smelting Company and the Alturas Consolidated Mining Company.

Dividends.

Granite Mountain Mining Company, of Montana, has declared a dividend, No. 28, of 50 cents per share, or $200,000, payable on the 11th inst.

Mary Murphy Mining Company, of Colorado, has declared a dividend, No. 4, of five dollars per share, or $17,500, payable on the 9th inst.

Westmoreland & Cambria Natural Gas Company of Pennsylvania has declared a quarterly dividend of 2½ per cent out of the earnings of the last three months, payable on the 10th inst.

Assessments.

COMPANY.	No.	When levied.	Delinquent in office.	Day of sale.	Amount.
Alta, Nev	35	Feb. 9	Mar. 16	April 5	.50
Baker Divide, Cal	23	Mar. 19	Apr. 19	May 9	.25
Belle Isle, Nev	10	Feb. 9	Mar. 16	Apr. 7	.20
Belt Cons., Dak	2	Mar. 15	Apr. 15	Apr. 30	.01
Best & Belcher, Nev.	36	Mar. 8	Apr. 15	May 5	.50
Camp Creek Placer, Cal	1	Jan. 20	Mar. 10	Apr. 14	.10
Comstock, Nev	3	Mar. 16	Apr. 18	May 5	.15
Dolores Con., Nev	4	Mar. 2	Apr. 11	Apr. 29	.05
Eureka, Dak	8	Mar. 17	Apr. 21	May 7	.01
General Crook, Dak.	3	Feb. 12	Apr. 1	Apr. 15	½
Gould & Curry, Nev.	55	Mar. 8	Apr. 11	May 4	.50
Hale & Norcross, Nev	...	Mar.	.....	.....	.50
Homeward Bound, Dak.	3	Mar. 18	Apr. 23	May 10	¼
Liberty, Dak	4	Mar. 15	May 2	May 19	.01
Manhattan, Nev.	5	Mar. 23	Apr. 25	May 10	1.00
May Flower, Cal.	33	Mar. 23	Apr. 25	May 16	.25
McDonell, Dak.	2	Feb. 26	Apr. 4	Apr. 23	½
Mono, Cal	..	Mar. 31	...	...	.50
Navajo, Nev	17	Mar. 14	Apr. 21	May 13	.25
New Era, Dak	2	Mar. 5	Apr. 5	Apr. 20	½
Nevada Queen, Nev.	2	Mar. 10	Apr. 14	May 6	.50
North Belle Isle, Nev	12	Mar. 14	Apr. 19	May 11	.50
Potosi, Nev	27	Mar. 9	Apr. 14	May 4	.30
Ruby Hill, Nev	13	Mar. 4	Apr. 5	May 5	.01
Ruby Bell, Dak	2	Feb. 23	Mar. 28	Apr. 16	.002½
Sampson, Utah	....	Mar. 7	Apr. 11	May 9	.25
Seabury-Calkins Cons., Dak	5	Mar. 1	Apr. 9	Apr. 30	.01
Sierra Iron, Cal.	6	Feb. 17	Mar. 30	Apr. 23	2 50
Silver Reef, Dak	2	Mar. 1	Apr. 2	Apr. 18	½
U. S. Grant, Dak	1	Mar. 2	Apr. 4	Apr. 23	¼
West Galena, Dak	5	June 5	*Apr. 1	*Apr 19	½

*The delinquent day and the day of sale were postponed to dates given above.

Pipe Line Certificates.

Messrs. Watson & Gibson, petroleum brokers, No. 49 Broadway, report as follows for the week:

The oil market this week has been dull and almost stationary. Traders are awaiting for the Billingsby bill to be disposed of by the Pennsylvania Legislature.

The following table gives the quotations and sales at the Consolidated Stock and Petroleum Exchange:

	Opening.	Highest.	Lowest.	Closing.	Sales.
Mar. 26	63¼c.	63⅞c	63¼c.	63⅛c.	728,000
28	63⅜	63⅞	63⅜	63⅜	388,000
29	63⅛	63⅛	63	63⅜	546,000
30	63⅛	63¾	63⅜	63⅜	426,000
31	63⅛	63¾	63⅜	63⅜	370,000
Apr. 1	63⅜	63⅜	63¼	63⅜	516 000
Total sales in barrels					2,974,000

Boston Mining Stocks.

[From our Special Correspondent.]

BOSTON, March 31.

The market for railroad stocks, bonds, etc., has ruled extremely active in Boston the past week, which with several other specialties has tended to absorb all the interest of operators and left the market for mining stocks dull and uninteresting. What little business has been done in copper stocks has been confined to a few stocks, and prices have, as a rule, been rather heavy. Calumet & Hecla declined to $211, on very small sales. Quincy to $49¾, with later sales at $50. Franklin sold from $11 to $11¼, with moderate transactions.

Osceola is firmer on report of sale of land, and advanced to $23. Atlantic advanced from $9@$10 on sales of 250 shares. Kearsarge also sold 50c. higher, at $8. Allouez seems to be wanted at about $2, while Huron declined to $1⅛. Pewabic sold at $2@$2⅛. Ironton Iron has been very quiet this week. The price, however, is steady at $11@$11⅝.

In silver stocks, there is but very little doing, but Bonanza is being very quietly picked up at $1½@$1⅝, and a lively market in this stock may soon be expected.

Breece is also strong at 60@65c. Dunkin, always a favorite in this market, advanced to 40c., and is in active demand. Cusi, steady at 22@25c. Catalpa and Crescent quiet at 32@35c. for the former, and 12@13c. for the latter.

Gogebic Iron Stocks.

The market remains firm, the prices of the leading stocks are steadily advancing, there are many new buyers in the field, and the general outlook is much brighter than at any time since the discovery of the range.

It is stated by the Moore-Benjamin Company (Limited), of this city—of which Mr. Isaac T. Stoddard is the general manager—that an order for a few shares of the Penokee & Gogebic Development Company—better known as the Colby stock—could not be filled on March 31st at less than $750 per share. The improved condition of the Anvil mine has advanced the price of this stock, which is now quoted at from $10@$12. Aurora is firm. The first of the two quarterly dividends declared some time ago was due April 1st, and amounted to $40,000. The second is due July 1st. The stock is quoted at $20. Both Sunday Lake and Bessemer are active stocks, and there is a good demaand for the stock of the Pence & Snider Iron Development Company, as well as for many other stocks of this range.

The great bodies opened in the Iron King have added largely to the value of that stock.

NAME.	No. of shares.	Pres't value.	NAME.	No. of shares.	Pres't value.
Aurora	100,000	$21.00	Laura	40,000	$3.50
Anvil	40,000	11.00	Montreal	20,000	32.00
Amazon	40,000	4.75	Moore	40,000	4.25
Ashland	40,000	36.00	Mikado	40,000	3.50
Agogetic	40,000	2.00	Minnewawa	40,000	5.00
Atlantic	40,000	7.00	Nimikon	40.000	11.50
Berringer	100.000	2.50	Nort'rn Chief	30,000	125.00
Bonnie	40,000	8.50	Norway	20,000	2.50
Blue Jacket	40,000	7.00	Norrie	30,000	50.00
Black River	20,000	20.00	Odanah	20,000	11.00
Bessemer	20,000	9.00	Old Nokomis	40,000	2.25
Brotherton	80,000	6.25	Pabst	250	2,000
Bourne	40,000	5.00	Puritan	40,000	22.00
Crown Point	100,000	1.75	Pence & Snyder I. D.Co.	100,000	3.75
Caledonia	40,000	3.00	Pence	40,000	5.00
Colby	*	*	Penokee & G. D. Co	5.000	750.00
Emma	40,000	3.00	Palms	40.000	7.00
Father Hennepin	40,000	4.00	Ryan	40,000	6.50
First Nation'l	80,000	4.50	Superior	100,000	3.50
Flor'ce May	40,000	2.75	Section 33 Co	20,000	11.00
Germania	40,000	15.00	Sunday Lake	40,000	7.75
Gogebic I. Sy	200,000	4.00	Snider	40,000	5.00
Gogebic R. & I. Co. (fee)	40,000	5.00	Trimble	40,000	7.00
Gogebic	40,000	3.00	Tontine	40,000	3.75
Iron King	40,000	18.00	Union	40,000	3.25
Ironton	40,000	11.25	United I. & L. Syndicate	200,000	.75
Iron Prince	40,000	3.00	*W L. & Min'l	90,000	1.00
Ironsides	40,000	2.50	Valley	120,000	3.50
Iron Chief	40,000	5.00			
Kakagon	40,000	13.00			

*See Penokee & Gogebic Development Company. † Includes fee.

The shares of the above companies all have a par value of $25, excepting the Pabst, the Penokee & Gogebec Development Company, and the Northern Chief, which are $100 par, and the Superior and Wisconsin Land and Mineral Company, $10 par.

Pittsburg Stock Quotations, Mar. 31.

COMPANY.	H	L.	Closing
Allegheny Gas Company	$35⅛	$35	$35
Chartiers Valley Gas Company	93	91⅛	91¾
Columbia Oil Company	2⅛	2⅛	2⅛
Consignee Mining Company	.65	.35	.50
Forest Oil Company	105	100	105
Hazelwood Oil Company	48	48	48
La Noira Mining Company	4⅛	3⅞	4½
Natural Gas Company of West Va	100	100	100
New York & Clevela'd Gas Coal Co	47⅛	47⅛	47⅛
Pennsylvania Gas Company	53⅜	37	37
Philadelphia Company	54⅞	53	53⅛
Pine Run Gas Company	99	99	99
Pittsburgh Gas Company	53⅛	53⅛	53⅛
Silverton Mining Company	2⅛	1¾	2⅛
South Side Gas Company	28⅛	27⅛	28¾
Tuna Oil Company	69	64	68
Washington Gas	100	100	100
Westinghouse Air-Brake Co	98	97	97
Westinghouse Brake Co., Lt	50	50	50
Wheeling Natural Gas Company	45	44	45
Yankee Girl Mining Company	8¼	8	8

Highest and lowest prices during the week.

Baltimore Stock Quotations.

COMPANY.	H.	L.
Atlantic Coal	†$1.55	†$1.55
Baltimore & N. Carolina	* .60	† .50
Conrad Hill	* .30	† .20
George's Creek Coal	* .85	* .83
Lake Chrome	* .50	† .10
North State (Balt.)	* .65	† .57
Ore Knob	* .14	† .11
Silver Valley	* 2.00	† 1.90

†Bid. *Asked.

Highest and owest prices bid and asked during the week.

St. Louis Mining Stocks. April 1.

[From our Special Correspondent.]

Telegraphic advices report that the market has been dull during the past week, the only note of interest being the increase in the monthly dividend of the Granite Mountain Mining Company from $100,000 to $200,000. The price of the stock has advanced to $65, the other stocks remain unchanged.

COMPANY.	Location.	Bid.	Asked.
Adams, s. L	Colo.	$2.00	$2.25
Courtland	Colo.	.....	.25
Granite Mountain, s	Mont.	.....	65.00
Hope, s	Mont.	*6.50	6.90
Ideal, s. L	Colo.	.50	55
Iron Gold and Silver	N. Mex.	.....	.03
Laclede	N. Mex.	.....	.03
Peacock	N. Mex.	1.25	1.40
Quincy	Colo.	.....	.05
Sheridan	N. Mex.	.40	.45
Small Hopes Cons., s. L	Colo.	8.00	8.25
St. Louis & Mex. Imp.	Mex.	1.25	1.30
St. Louis & St. Elmo	Colo.	.....	.35
St. Louis & Yavapai	Ariz.	.90	.95
West Granite, s	Mont.	1.15	1.25

* New stock. Par value, $10.

Southern Coal and Iron Stocks.

	H.	L.
Ætna Iron	1.05	1 05
Alabama & Tennessee Coal and Iron	.65	.65
*Alice Furnace	1.05	1 00
*Coalburg Coal and Coke Company	1 00	1.00
Florence Land Mining Company	.30	.22
La Grange Furnace Company	.75	.70
*La Grange Furnace	.90	.90
*Mary Pratt Furnace	1.01	1.00
*Pratt Coal and Coke Company	1.05	1.00
Rockdale Iron and Manufacturing	.75	.75
Sheffield Land and Coal	2 25	2.10
*Sloss Furnace	1 05	1.03
*South Pittsburg RR. Iron and Coal	1 00	1.00
Tennessee Coal, Iron and RR., new	.47	.43
*Tennessee Coal, Iron and RR.	.96	.96
†Tennessee Coal, Iron and RR.	.98	.98
‡Tennessee Coal, Iron and RR.	.85	.85
*Alice Furnace (first mort.)	1.02	1.02
Tennessee Valley Iron and RR	.35	.35
Warner Iron	1.40	1.40

* Bonds. † Bonds South Pittsburg. ‡ Bonds ore mines.

COPPER ORES WANTED

FOR EXPORT.

Address particulars to

CUPROM,
Office of this paper.

ISAAC ROSENWALD, Prest. WALTER B. SCOTT, Sec'y.

Capital Stock Paid Up, $200,000.

New York and Gogebic

INVESTMENT COMPANY,

No. 10 Wall St., New York.

GOGEBIC MINING STOCKS

BOUGHT AND SOLD.

Mines Examined and Information Furnished to Investors.

HUSSEY HOYT & CO.,

Investment Bankers.

Gogebic and Upper Peninsula Iron Mines and Iron Mining Stocks, and Investment Securities.

HUSSEY HOYT & CO.,

231 Bank Street,

Cleveland, Ohio.

SPECIAL NOTICES.

FREE ADVERTISING.

Inquiries from employers in want of Superintendents, Engineers, Metallurgists, Chemists, Mine or Furnace Foremen, or other assistance of this character, will be inserted in this column WITHOUT CHARGE.

The labor and expense involved in ascertaining what positions are open, in gratuitously advertising them and in attending to the correspondence of applicants, are incurred in the interest and for the *exclusive* benefit of *subscribers* to the ENGINEERING AND MINING JOURNAL.

Applicants should inclose the necessary postage, for forwarding their letters.

178 WANTED—A THOROUGHLY EXPERIenced foreman for a free-gold amalgamating mill in a healthy district of Ecuador, S. A. Must have a successful and honorable record. Address, stating salary, references, etc., ECUADOR,
Care of ENGINEERING AND MINING JOURNAL.
Foreign postage.

183 WANTED - A MILLWRIGHT TO GO to a healthy part of South America; one competent to erect, and if necessary run a free gold amalgamating mill. Address, stating experience, references and salary wanted, SOUTH AMERICA,
Care of ENGINEERING AND MINING JOURNAL.

198 WANTED—A MAN EXPERIENCED IN the manufacture of blasting powder. Address BLASTING,
Care of ENGINEERING AND MINING JOURNAL.

199 WANTED—AN EXPERIENCED MANager for a Wire, Nail and Rivet Factory. Address, with references and salary expected, RIVET,
Care of ENGINEERING AND MINING JOURNAL.

200 WANTED—IMMEDIATELY, ONE Mechanical Draughtsman, thoroughly familiar with the details of iron mill work; also one young man to make tracings, and two or three first-class Pattern Makers for general work. Address, with references, etc., PATTERNS,
Care of ENGINEERING AND MINING JOURNAL.

201 WANTED—TWO ENGINEERS EXperienced in water-works and sewerage construction, and competent to take charge of works. Address, with full particulars, salary expected, experience, etc., CALUMET,
Care of ENGINEERING AND MINING JOURNAL.

202 WANTED—A MAN FAMILIAR WITH galvanometer work, to work steadily on testing. Address, with reference, etc., GALVANOMETER,
Care of ENGINEERING AND MINING JOURNAL.

203 WANTED—A FOREMAN IN AN electric manufacturing shop; one who has a knowledge of dynamo building preferred. Address DYNAMO,
Care of ENGINEERING AND MINING JOURNAL.

204 WANTED—A CHIEF DRAUGHTSman and Assistant Engineer for a Mining and Land Company in the South. Salary, $125 per month. Address, with particulars, CHIEF,
Care of ENGINEERING AND MINING JOURNAL.

205 WANTED—A MECHANIC ACquainted with die and general jobbing work, to take charge of wire-nail machinery in the Northwest. Address, with particulars and references, NORTHWEST,
Care of ENGINEERING AND MINING JOURNAL.

206 WANTED—AN EXPERIENCED MINE surveyor, accustomed to accurate work. State experience and salary expected. Address TRANSIT,
Care of ENGINEERING AND MINING JOURNAL.

207 WANTED—A THOROUGHLY COMpetent Mine Captain. One with experience also in Copper Smelting preferred. Address, COPPER,
Care of ENGINEERING AND MINING JOURNAL.

208 WANTED—A RELIABLE AND EXperienced man to take charge of and open out a Placer Mine. A high salary will be paid to a really competent man. Address WEST,
Care of ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

AN ENGINEER IS READY FOR AN engagement in any healthy country, Mexico or South America preferred. Speaks Spanish. Silver and gold mining and treating. Would accept a situation as assayer or surveyor, or both together R. B.,
Care of ENGINEERING AND MINING JOURNAL.

WANTED—A POSITION AS MANAGER or assistant manager of an iron or steel-works; have experience in operating and building blast furnaces and iron and steel-works; also, the necessary commercial, experience in managing them. Address JAMES HENDERSON, Belleville, New Jersey.

A CHEMIST OF HIGH STANDING AND long and varied practical experience will accept situation as chemical adviser or director of any chemical manufacturing operation, at a very moderate salary. Address CHEMICAL EXPERT,
Care ENGINEERING AND MINING JOURNAL.

WANTED—POSITION IN MANAGEMENT of copper, lead, or silver mines, concentration or smelting-works, requiring experience, energy and skill. Last employed in opening copper mines and building smelting-works in New Zealand. Address CARL HENRICH, Noble, Richland Co., Ill.

WANTED—A GENTLEMAN EXPErienced in soliciting municipal engineer work. Address, stating age, experience, salary expected, and references, NEGOTIUM,
Care of ENGINEERING AND MINING JOURNAL.

DIVIDENDS.

PLYMOUTH CONSOLIDATED GOLD MINING COMPANY, 23 NASSAU STREET,
NEW YORK, March 12, 1887.
DIVIDEND NO. 47.

The Board of Trustees have declared a dividend of TWENTY-FIVE THOUSAND DOLLARS, the same being *twenty-five cents* per share of the capital stock of the company, payable on the 5th day of April at the Company's offices in New York and San Francisco.

W. VAN NORDEN, President.

COLORADO CENTRAL CONSOLIDATED MINING COMPANY.

The regular dividend, No. 15, of FIVE CENTS PER SHARE ($13,750) has been declared to the stockholders of this company, payable on April 11th, at the Farmers' Loan and Trust Company.

Transfer-books close on April 1st, reopening on April 12th. R. V. MARTINSEN, Treasurer.

NEW YORK, March 10, 1887.

FOR SALE.

A large and valuable tract of COAL AND IRON LANDS in East Tennessee, containing about 16,000 acres; also WALDEN'S RIDGE RAILROAD FURNACE, COKE OVENS, etc., to be sold at chancery sale to highest bidder at Court-House, in Knoxville, Tenn., on Monday, 18th day of April, 1887, at 11 o'clock A.M.

For terms and other information address

E. C. LACKLAND,

St. Louis, Mo.

GOLD MINE.—A FIRST-CLASS FREE GOLD property in Wyoming, developed ready for mill; working capital stock for sale to provide for mill. Very promising investment. Considerable high-grade ore on hand for milling. Address, GEO. W. KEEL, Salt Lake City, Utah.

WANTED—2000 FEET SECOND-HAND Iron T-Rail; 12 to 16 pounds per yard. Address HENRY BAYARD & CO.,
2900 N. Broad St., Philadelphia, Pa.

FOR SALE.—DIAMOND DRILL, BUILT by the American Rock-Boring Company, but little used, and good as new. Boring depth, 2000 feet. Machine is complete, with every attachment. For particulars address DIAMOND DRILL,
P. O. Box 2345, New York City.

THE 'SERGEANT' ROCK DRILL

IS

More Simple in Construction,

More Effective in Operation,

AND

REQUIRES LESS REPAIR

THAN THE BEST-KNOWN ROCK DRILLS IN THE MARKET.

WE ARE PREPARED TO PROVE THE ABOVE STATEMENT.

AGENTS FOR THE NORWALK AIR COMPRESSOR.

Correspondence solicited and estimates furnished for all kinds of machinery required in

Mining, Quarrying, or Contract Work.

ADDRESS

SERGEANT DRILL CO., 16 Dey Street, NEW YORK.